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FURTHER OBSERVATIONS ON AN OVARY-STIMULATING HORMONE OF THE PLACENTA*

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INTRODUCTION

AS has been stated in preliminary communications^{24, 25} on this subject, the writer became interested in the problem of the isolation of the estrogenic hormone from the placenta after a visit to the Biochemical Laboratories at McGill University of Dr. B. P. Wiesner, of the Department of Animal Breeding, Edinburgh University. Dr. Wiesner very frankly laid the problem before us and urged us to undertake research in this field. The result of our investigation, which will now be given in detail, may be said to be built upon and to be the outcome of the earlier work of Wiesner and his collaborators.

LITERATURE

It has long been known that the placenta contains a substance capable of producing oestrus changes in the uterus and vagina of oöphorectomized animals, and to this extent duplicates the endocrine function of the ovary.⁵⁵ As recent reviews of the properties of this substance (oestrin)^{53, 79} and of the physiology and pathology of the placenta⁷² are available, only the more important characteristics need be mentioned. Oestrin is lipoid-soluble but not insoluble in water; it is not destroyed by high temperatures, nor by acids nor alkalis; and is not inactive when administered orally. With

few exceptions^{57, 100} workers are agreed that it has no stimulating action on the ovary.

Hirose, in 1920,⁵⁹ demonstrated that intraperitoneal injections of a suspension of placenta produced in rabbits marked changes in the ovaries, especially the appearance of numerous corpora lutea; this effect was not obtainable with acetone or ether extracts. Placenta was found to be active only in the first half of pregnancy. This paper has not been accessible to us, and we have found it quoted only by Murata and Adachi⁷⁴ who confirmed and greatly extended its conclusions. They found that the enlargement of the uterus noted by Hirose could not be produced by this technique in oöphorectomized animals, and concluded that it was due not to the oestrin content of the injected material but to the secretion of oestrin by the ovary.

In the meantime attention had been directed to the anterior hypophysis. Evans and Long,^{39, 40} in producing gigantism in rats by continued massive injections of saline extracts of this tissue, had noted a suppression of the oestrus cycles and an accumulation of lutein tissue in the ovaries; ovulation in the hen was similarly suppressed.^{109, 75} But experiments in grafting⁵² and parabiosis^{71, 50} suggested that an ovary-stimulating substance circulated in the blood even of castrated animals, and Zondek and Aschheim set themselves to discover its source. They found^{113, 114, 115} that intramuscular implantations of small amounts (10-20

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mgm.) of macerated anterior hypophysis into immature female mice led rapidly to the premature appearance of puberty, as judged by the ripening of follicles and ovulation, formation of corpora lutea, and an outpouring of œstrin, demonstrated by the opening and cornification of the vagina and the enlargement and hyperæmia of the uterus. Similar results were independently obtained by Smith and Engle^{95, 96, 97} with rats, the observed super-ovulation being especially remarkable. None of these effects could be produced in oöphorectomized animals.

These findings have been confirmed repeatedly.^{17, 18, 20, 41, 49, 70} The active principle appears to be present in the anterior hypophysis at all ages^{88, 89, 92, 93, 94, 66} and in male animals and castrates to an extent greater than in normal females;⁴² in pregnancy, the amount present decreases.^{10, 81} It is present also in other human tissues, as in the decidua and the placenta (implants of 0.1 gm.), especially in the first half of pregnancy,⁸¹ in the corpora lutea of pregnancy, and in the blood and urine from an early stage in pregnancy till some days after parturition.³ It is not demonstrable in blood or urine at other times, except occasionally in infants,^{21, 80} nor regularly in amniotic fluid,^{21, 81} nor in cerebrospinal fluid during pregnancy.^{48, 90, 31} These results led Aschheim and Zondek^{4, 8, 9} to suggest the injection of one or two c.c. of urine into immature mice as a test for pregnancy. They describe three reactions which may follow: (1) development of follicles and œstrous changes in the vagina and uterus; (2) hæmorrhages into the follicles, usually visible macroscopically; (3) formation of corpora lutea, chiefly atretic. These reactions are not specific for pregnancy, as they may be obtained with urine from cases of various endocrine disorders, tumours, or inflammatory lesions,⁶ or in amenorrhœa, or at the menopause.³² Reactions 1 and 2, however, permit a diagnosis of pregnancy from the second month onwards, and give correct results, positive or negative, in about 97 per cent of the cases, as other workers have also found.^{69, 30, 63, 106} Positive results have also been obtained with the urine in pregnancy in apes³⁰ and monkeys, but not in the cow, sow, rabbit, or mouse.³⁰ Active extracts have been prepared from the anterior hypophysis, and from the human placenta or urine of pregnancy.^{118, 17, 85, 41} It is frequently im-

possible to discover from the writings of the German workers the source of the material used, and it has been universally assumed that the active principle is the same in each case. Evans and Simpson⁴³ however, point out that while the increase in size of the ovary is roughly proportional to the amount of hypophyseal material implanted, no such linear relation can be discerned with injections of varying amounts of urine of pregnancy.

Injections of such extracts into immature mice (3 to 4 weeks, 6-8 gm.) or rats (4 to 5 weeks, 30-35 gm.) produce effects similar to those of the solid implants, except that ovulation is seldom if ever observed,^{37, 123} and the tendency to atretic luteinization and hæmorrhage is greater. The outpouring of œstrin leads to the uterus becoming distended and hyperæmic; the vaginal smear shows cornified cells and an absence of leucocytes, and the blood cholesterol probably rises.^{86, 119} The unit is usually taken as the amount which, divided into six doses, produces signs of full œstrus in about 100 hours in such immature rodents. Mice are absolutely as well as relatively less sensitive than rats.¹¹⁹ The absence of œstrin must be demonstrated by negative results with oöphorectomized animals; the weight of evidence⁹³ is against the view that an œstrin effect may be obtained with anterior hypophysis. Copulation may take place during such premature œstrus,⁹⁶ but the age at which the animals first become pregnant is not reduced.³³ If the injections are continued, the ovary enlarges to ten times the normal size, and consists almost wholly of corpora lutea, the majority of which are atretic and often hæmorrhagic. The cyclic changes in the vagina may persist for some time¹⁸ but tend to disappear, and the epithelium passes into a secretion phase with a high mucous layer, while the uterus is no longer distended, but its muscular layers are hypertrophied.^{121, 73}

These effects may be ascribed to the internal secretion of the corpora lutea,^{26, 111} the activity of those produced by this treatment having been demonstrated by the deciduoma reaction.^{103, 74, 19, 44} This hormone itself may be present in the placenta.⁶¹ The luteinization and enlargement of the ovaries are also conspicuous in mature animals, though super-ovulation may still be produced by implants.^{96, 34} In the ovaries of pregnant mice¹¹⁷

or rabbits⁷⁴ the formation of new corpora lutea may be evoked, in some cases certainly preceded by ovulation, without disturbing normal parturition. This is not a constant finding⁹² and in other hands extracts of anterior hypophysis¹⁰² or placenta⁴⁴ have impaired the birth mechanism or³⁵ produced abortion or reabsorption of the fetuses. Immature male rodents react less strikingly to treatment of this kind than do females; there is accelerated development of the seminal vesicles and accessory glands, to a lesser degree of the penis and testes;^{96, 107, 121, 18} the endocrine activity of the testes is said to be increased,¹⁰¹ but spermatogenesis may actually be inhibited.^{16, 36} In doves, however, the testes may be very greatly enlarged after implantation or injection of glycerol extracts of anterior hypophysis.⁸⁷ The ovaries of senile female mice may be reactivated so that œstrus cycles may reappear,¹¹⁸ but when implants were made into mature mice, which for unknown reasons showed no œstrous cycles, the first induced œstrus was not followed by renewed cyclic activity.⁶⁷

In rabbits, ovulation following the injection of extracts of anterior hypophysis has been observed,¹⁴ but the formation of lutein cysts in the ovary⁵⁴ appears to follow; this latter change has also been seen in dogs.^{17, 86} Implants made into apes may stimulate follicular growth,² or may produce enlargement of the uterus without visibly affecting the ovaries;²⁹ several workers, however, have insisted on the independence of the endocrine activities of the ovary.^{78, 116, 110} In human subjects, implants failed to induce menstruation in a case of delayed puberty, or after the menopause, but good results were obtained in the treatment of various menstrual disorders²⁸ and soluble preparations have also been used with some success;^{17, 120, 60, 76, 91} hyperæmia and hyperthermia in the pelvic region may be noted, but not invariably.²² Since in the case of hydatid mole and malignant chorionepithelioma the pathological tissues^{74, 5, 51, 90} and the urine^{5, 122, 77} contain large quantities of the hormone, an explanation of the frequent appearance of lutein cysts of the ovary in these conditions, or in the presence of hypophyseal tumour,¹⁰⁸ seems not far to seek.

The most widely known of the chemical char-

acteristics of the hormone is its instability; it is destroyed by boiling and injured at 60°C., or by exposure to strong acids or alkalies,^{118, 17} or to digestive enzymes,⁵⁰ and in consequence is ineffective when given by mouth, except in very large doses and under the most favourable circumstances.^{119, 56, 98} It is diffusible and dialyses rapidly, a fact which may be taken advantage of in its preparation.^{118, 17} It is said to be soluble in water or dilute acids, but insoluble in fat solvents, and is purified¹¹⁹ by precipitating it from aqueous solution by the addition of alcohol. We have not been able to find specific claims of the maximum potency and concentration obtainable by such means; commercial preparations may contain 50 rat units per c.c., but are decidedly toxic.⁴⁷ Dickens²⁷ has described a new preparation from the urine of pregnancy by precipitation with saturated ammonium sulphate and subsequently with tannic acid. His preparation is active in doses of 0.01 mgm. by injection, is not destroyed by pepsin or trypsin, but is unstable in acids or alkalies, and is insoluble in alcohol. Where œstrin is present in the original material (placenta or pregnancy urine) it is usually removed by extraction with ether or some other fat-solvent; we do not feel confident, however, that a quantitative separation has always been obtained in the preparation of either fraction.

Alkaline extracts of the anterior hypophysis promote growth^{45, 82} and acromegalic and splanchnomegalic distortion,⁸⁴ with enlargement of the gonads,¹⁰⁵ and temporarily lower the non-protein nitrogen of the blood,¹⁰⁴ while they produce extensive luteinization in the ovary and lead to a suppression of œstrus;^{41, 78, 54, 62} extracts made with dilute acid, however, are not growth-promoting,⁶⁴ but promote premature puberty,^{41, 83, 12, 13, 58, 17, 110} yet they are not free from the tendency to cause luteinization, and to impair the birth mechanism; this is also true of the extracts from placenta or urine, which are devoid of growth-promoting power.^{41, 44, 112, 73} Evans believes that the alkaline extracts actually antagonize the puberty-accelerating effect of acid extracts or of implants.⁴¹ That the ovarian response to implants, to acid hypophyseal extracts, or preparations from placenta or urine, may take the form either of follicular or of luteal development has been regarded by many workers¹⁷ as a question

of dosage, or¹³ of the initial stage of the ovary. Amongst those²¹ who believe that two distinct hormones are concerned, Wiesner^{110, 112} has taken a leading position. He distinguishes "Rho-one", which stimulates the secretion of the œstrin, the maturation of follicles and the formation of corpora lutea, from "Rho-two" which maintains the corpus luteum in activity and stimulates it to internal secretion.^{111, 73} Extracts of either anterior hypophysis¹¹⁰ or placenta,¹¹² made with sulphosalicylic acid, contain both principles (an ingenious hypothesis is offered to explain the predominance of one or the other, according to dosage), but as "Rho-one" is totally destroyed by heating to boiling for one minute, while "Rho-two" in part survives such treatment,^{112, 74} a clear separation can be obtained.

Mucification of the vagina in immature rats is the test by which "Rho-two" is assayed; this appears in sections, but is not detectable by the smear technique. Claus²³ has obtained from the anterior hypophysis a microcrystalline substance insoluble in absolute alcohol which promotes premature puberty and ovulation in female rodents; the potency is not stated but a great loss of activity is apparently involved in the preparation. A fraction soluble in absolute alcohol produced luteinization; the physiological effect of unresolved mixtures is dependent on the dose. Aschheim⁷ pointed out that certain urines gave reaction 1, *i.e.*, œstrus, but never gave reactions 2 or 3, *i.e.*, hæmorrhagic follicles and luteinization. Zondek^{123, 124} has now accepted the view that two hormones are concerned, "Prolan A", which causes œstrin secretion, and "Prolan B", which is assayed by the appearance of corpora lutea in the ovaries of immature mice; he claims, also, to have obtained "A" free from "B" from the urine of non-pregnant women, especially after natural or artificial menopause. The significance of the follicular hæmatomata is obscure; Fellner⁴⁶ regards the phenomenon as due to a non-specific, irritant impurity.

The relation of the placenta to the anterior hypophysis in this system remains obscure. Placental extracts induce in the hypophysis histological changes^{1, 15, 65} similar to those seen in pregnancy,³⁸ but this may be due merely to œstrin.¹¹ Zondek,¹²² like Philipp,⁸¹ is inclined to believe that the placenta does not merely collect and store the hormone produced by the

anterior hypophysis, but takes an active part in the production; but he maintains that the flooding of blood and urine with the hormone takes place so early in pregnancy that it must be ascribed to hypophyseal, not to placental, activity.

METHODS

Sulphosalicylic acid was employed in the first instance as an extracting agent, and it was used in the manner described by Wiesner.¹¹⁰ Fresh or recently collected human placenta were used. It was also found that frozen placenta could be used and that the process of freezing did not materially affect the yield of active extract.

It was found that the injection of dilute sulphosalicylic acid extract into immature rats consistently produced the phenomenon of premature maturity. While attempts were being made to concentrate this extract and at the same time remove the sulphosalicylic acid without loss of potency (a result which was not achieved), it was decided to make some preliminary trials with acetone and alcoholic extracts of the fresh placenta. Dr. Wiesner had told us that he had had no success in the use of alcohol or acetone in the making of potent extracts, and in his recent paper he has emphasized this fact. However, it has been our experience that extraction of the material with neutral or faintly acidulated alcohol or acetone yields at once an extract which is invariably potent. When this fact had been thoroughly established it was decided to abandon the sulphosalicylic acid extraction process, and to develop a standard technique based upon the preliminary treatment with acetone or alcohol. Numerous attempts were made to fractionate these simple extracts and to recover the maximum amount of active substance in some one fraction. It should be added here that we had convinced ourselves at the outset that we were not dealing with œstrin. This factor has been carefully controlled by repeated extraction of our extracts with ether before submitting them to assay, and also by the use of proven oöphorectomized rats. These latter animals have been shown to be reactive to œstrin both before and after treatment with the œstrin-free placental ex-

tracts, and they have given uniformly negative responses to such extracts.

One process which has been found to give excellent results, making use of human placenta, is as follows:

The placental tissue is finely pulped and treated with either one and one-quarter volumes of acetone or two volumes of 95 per cent ethyl alcohol. When one is using alcohol as the extracting vehicle one may with safety add several volumes of this reagent to the freshly ground glands, as the active principle which one wishes to obtain appears to be soluble in all strengths of grain alcohol. The mixture is kept agitated for some time and is then allowed to stand at room temperature for twenty-four hours. The fluid content is next separated from the mixture by the use of a suitable press. It is filtered, and to the filtrate one adds one-half c.c. of glacial acetic acid per litre. The reagent, acetone or alcohol, as the case may be, is removed by distillation at low temperature and reduced pressure. Concentration of the aqueous phase is continued until one has obtained a volume equal to one-half that of the placental tissue originally extracted. A filtering agent is now added to facilitate rapid filtration and to remove by adsorption a certain amount of undesirable material. An acid-washed hydrated aluminum silicate, such as Lloyd's reagent, has given excellent results in our hands. The filtrate is returned to the still and very cautiously concentrated under reduced pressure to the consistency of a thin syrup. Ten volumes of alcohol, either absolute or 95 per cent strength, are added. It is important that the alcohol be added very slowly and that the mixture be kept violently agitated during the process. The purpose of adding such a quantity of high grade alcohol at this stage is to remove by precipitation undesirable material and to retain in alcoholic solution the bulk of the active principle. It may be noted that herein our process differs materially from other processes which have been suggested for the purification of maturity-producing factors.

The mixture of concentrate and ten volumes of alcohol may be placed in a freezer at a temperature of -10°C . for several hours. This, however, is not an essential step. The mixture is next filtered and the residue may be again extracted with hot alcohol and the extract thus

obtained filtered and added to the first extract. The combined filtrates are then concentrated under reduced pressure to a thin syrup and again treated with alcohol, preferably absolute, in the manner above described. The mixture is filtered and again concentrated to remove all traces of alcohol. The aqueous mixture remaining in the still is diluted with sufficient distilled water to allow of the extraction of lipoids by ether. This is done in a separatory funnel in the usual manner. The process of ether extraction should be repeated at least five times. The ether is removed from the aqueous solution by distillation at reduced pressure and the concentration process is then continued until the material in the distilling flask is almost dry. (An aqueous or dilute alcoholic solution of the product at this or an earlier stage—as, for example, after one treatment with ten volumes of alcohol followed by the removal of oestrin by ether—has been found to be satisfactory for most clinical needs). The residue is then extracted several times with small amounts of absolute ethyl alcohol.

The combined alcoholic extracts are filtered and the filtrate is made strongly ammoniacal by the addition of one-third volume of saturated aqueous ammonia. The mixture is placed in a crystallizing dish and allowed to concentrate by slow evaporation at room temperature. Several days may be allowed for this stage and small amounts of ammonia and alcohol may be added from time to time as indicated. The semi-crystalline solid material which separates out may be separated from the mother liquor and washed three times with dilute cold aqueous ammonia. The washed solid material is then extracted with hot absolute alcohol faintly acidified with glacial acetic acid. The alcoholic extract is treated with one-third volume of saturated aqueous ammonia and set aside. The solid material which separates is again treated as outlined above. One then obtains the final product by chilling the absolute alcohol extract of the above substance.

The precipitate from alcohol may be further purified by repeated solution in hot alcohol and separation by chilling of the filtered alcoholic solution. The purified product is relatively insoluble in water, and indeed its

separation from an alcoholic solution can be greatly facilitated by the addition of distilled water in amount sufficient to reduce the alcoholic concentration to 50 per cent, or even lower.

Some success has also been had with a modified procedure. The principle involved in this modification of the above method consists in the adsorption of the hormone upon calcium phosphate. In this method, therefore, one can work with very dilute aqueous solutions of the placental hormone, and to a large extent shorten the somewhat tedious process with alcohol. One adds to a known potent aqueous solution of the placental hormone, which has been freed of protein and lipid substances, sufficient neutral sodium phosphate solution to give a concentration of 0.2 per cent. The solution is then made strongly ammoniacal, and 5 per cent calcium chloride solution is slowly added. The mixture is stirred vigorously during the addition of the calcium chloride, enough of which should be added to precipitate all of the phosphate. The precipitate is recovered, washed with dilute ammonia and then extracted at least three times with hot 95 per cent or absolute alcohol which has been faintly acidulated with glacial acetic acid. The alcoholic extracts are combined, filtered, and concentrated to a small volume. The active principle may then be purified from this solution as indicated in the previous paragraphs.

PROPERTIES OF THE PURIFIED SUBSTANCE

As we have as yet been unable to obtain more than a few milligrams of the purified hormone at any one time, it is impossible in this communication to define with accuracy very much of the chemical properties of the active principle. The yield of the final purified product which has been obtained has been of the order of 1 mgm. per kilo of original placenta. The potency of an active extract has not been appreciably affected by boiling for five minutes in dilute acetic acid solution. We have, however, evidence of deterioration of the saline solution of the purified product. There has been such an urgent demand for the active extract for both laboratory and clinical experiments that the preparation of a sufficiently large sample of the purified product for chemical study has had to be postponed. This investigation is, however,

about to be continued, and it is hoped that one will be able to publish a detailed report of such a study very shortly.

PHYSIOLOGICAL EFFECTS OF THE ACTIVE PRINCIPLE

The only physiological effect of the hormone which we have been able to study in a quantitative manner has been the production of premature maturity in immature rats or mice. Rats have been used almost entirely for the detailed studies. Also it has been found best to use rats three weeks of age and under 35 grams in weight. In the early stages of the investigation the experimental animals were sacrificed five to seven days after the initial injection, and the vagina, uterus, and ovaries were sectioned and studied microscopically. The positive animals manifested the changes in the uterus and vagina usually associated with oestrus, but in addition the ovaries were enlarged, and on section corpora lutea were usually found as well as normal follicles in varying degrees of development. Later it was found satisfactory to use the vaginal smear method in routine testing of extracts. It has been our practice to make injections twice and at twenty-four hour intervals, the same amount of extract being administered on each occasion. The injections were made subcutaneously and the puncture sealed immediately with collodion. Vaginal smears were taken daily, starting on the third day (72 hours). An epithelial or squamous cell flush occurring up to the sixth day has been arbitrarily read as a positive. One may have some evidence of a positive reaction as early as the third day.

It is also of interest to note that corpora lutea have been seldom found in the ovaries of immature rats which have been treated with either a fraction soluble in 85 per cent alcohol or the recrystallized final product. This observation lends a considerable measure of support to the hypothesis of Wiesner that there is a separate principle which stimulates luteinization. The suggestion which was made in a preliminary paper²⁴ that the finding of corpora lutea in the treated animal might be made the basis of a test for active extracts of the hormone which we are studying is therefore untestable.

It having been established that the immature rat was a satisfactory test animal for the deter-

mination in a rough way of the potency of various extracts, it was deemed advisable to undertake a series of experiments to determine the effect of excessive dosage of the hormone upon both normal and pregnant animals. Up to this time we had tentatively accepted the hypothesis that the maturity-provoking factor of the placenta was identical with the anterior-pituitary gonad-stimulatory principle. As the investigation proceeded, however, it became apparent that a theory according to which the placenta is considered as the ductless gland of pregnancy, producing by an active process a pregnancy hormone with both physiological and chemical properties peculiar to itself, would fit the observed facts much better. While we do not feel that we have as yet sufficient evidence available to prove this theory conclusively, we are nevertheless of the opinion that there are many observations which support it. Some of this evidence may now be considered.

1. Extracts which have been prepared from anterior pituitary lobes by the use of acetone, as in the case of placenta, have been found to be non- α -estrogenic in character. These extracts have been prepared from small amounts of tissue. It is possible, however, that by the use of large amounts of these glands an active principle similar to that herein described may be obtained.

2. It has been repeatedly shown that the placental α -estrogenic hormone is effective by the oral route, and it is proposed ultimately to standardize the extract which may be made available for clinical use in terms of oral rat units.

3. Considering the limitations of accuracy in potency testing with a limited number of immature rats, we have observed no decrease in potency following treatment of active extract with either pepsin or trypsin.

4. The prolonged treatment of normal adult rats with large doses of the hormone has not resulted in any noticeable effect upon the cycles or upon impregnation or lactation. Moreover, such treated rats have shown no evidence of marked hypertrophy of the ovaries, nor has there been any evidence of superfetation. Abortion has not been produced. The hormone viewed as a pregnancy principle could not of course be expected to cause abortion.

The following condensed protocols of four experiments are of interest in this connection:

Rat No. 1: Weight 191 gm.

Nov. 8. Started daily injection of 50 per cent acetone extract = 3 gm. human placenta.

Nov. 14. Litter.

Dec. 4. Injections every second day.

Dec. 20. Male placed in cage.

Jan. 11. Equivalent of 5 gm. of placenta (85 per cent alcohol soluble) injected every second day.

Jan. 16. Litter (7).

Feb. 12. Male placed in cage.

March 17. Weight 187 gm. Killed for microscopic study of genital tract. Ovary normal (see Fig 6).

Rat No. 2: Weight 175 gm.

Nov. 8. Started daily injection equivalent to 3 gm. human placenta.

Nov. 18. Litter (6).

Dec. 4. Injection every second day.

Dec. 20. Male placed in cage.

Jan. 11. Litter (8). Standard injections, equivalent to 5 gm. of placenta, every second day.

March 21. Weight 176 gm. (See Chart 1, No. 14, for cycles).

Rat No. 3: Weight 137 gm.

Nov. 6. Started daily injection equivalent to 3 gm. of placenta.

Dec. 7. Injections every second day.

Dec. 24. Male placed in cage.

Jan. 11. Equivalent 5 gm. of placenta every second day.

Jan. 31. Litter.

Feb. 4. Eating poorly.

Feb. 26. Injections stopped on account of poor condition of animal.

March 8. Dead of respiratory infection. Weight 91 gm. Ovaries normal. (See Chart I, No. 13, for cycles).

Rat No. 4: Weight 136 gm.

Nov. 6. Started daily injection equivalent to 3 gm. placenta.

Dec. 6. Injection every second day.

Dec. 24. Male placed in cage.

Jan. 11. Equivalent 5 gm. placenta every second day.

Jan. 16. Litter (8).

Feb. 10. Male placed in cage.

March 10. Litter (7).

March 21. Weight 200 gm. Normal.

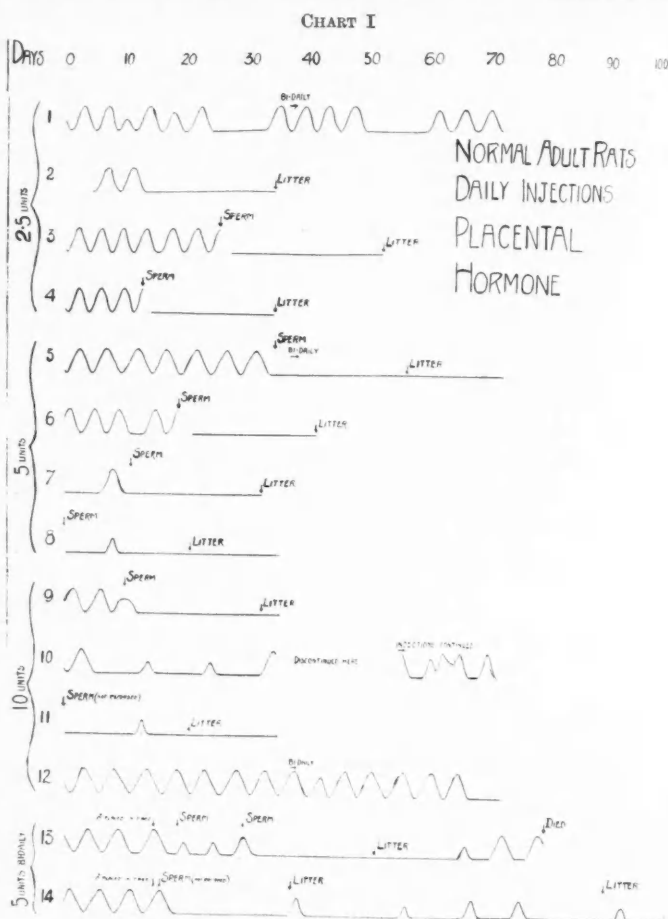
Also Charts 1 and 2 show the results of 17 experiments in which the hormone was administered daily or bi-daily, and in varying dosage. In general it may be said that we have little or no evidence of any interference with the normal sex functions in normal adults as a result of treatment with even massive doses of this hormone.

Normal rabbits and dogs, both male and female, have been injected daily with varying amounts of the active extract, up to 100 rat units in the case of rabbits and 200 rat units in the case of dogs, and frequent blood chemistry studies have been made on such animals up to one month. Apart from slight to moderate increases in the cholesterol content, which, however, we hold to be a non-specific action, nothing of significance has been observed in the chemistry of the blood.

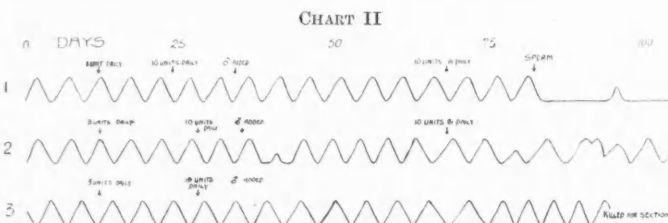
Normal female dogs and rabbits have not manifested any appreciable degree of hypertrophy of the ovaries when treated with the hormone. It is of interest to note that in such animals there has been no sign of luteinization of the ovaries, which on section have been found to be very rich in follicles in various stages of development (Figs. 1 and 2).

We have noted that immature rats which have been brought to a state of premature maturity by the treatment with the hormone commence at once, as a rule, to manifest the cyclic changes. This has occurred both in animals receiving the usual assay treatment and in others which have been injected daily for several weeks.

We have recovered sperm in a great many instances from the vagina of treated immature rats and have many examples of successful impregnations, associated with normal gestation, birth, and the rearing of litters. In no case, however, has impregnation occurred coincident with the first cycle. The earliest instance of impregnation which we have observed has been the third cycle, and here the young were born on the 62nd day of life of the mother. Some of these young mother rats have had difficulty in adequately



Showing the effect of daily or bi-daily injections of placental hormone into normal adult female rats caged with males. The unit used here was the equivalent of one gram of fresh human full term placenta.



A similar experiment to that illustrated in Chart I, except that preliminary control periods are shown. Rat No. 3 had normal ovaries.

nursing their young, while others have reared average weight litters. Since the purified hormone has been used we have not observed the formation of corpora lutea in association with the first cycle. These may be observed at later cycles, however, and one is tempted to associate failure of impregnation in our experience at the

first cycle with absence of the luteal phase. Long and Evans⁶⁸ have stated that the first cycle may be a non-fertile one. Fig. 3 and 4 represent sections of the ovaries of two immature rats brought to maturity with the hormone treatment. Each was sacrificed at the first oestrus period. Corpora lutea are absent in the first ovary and present in the second. The first animal received an absolute alcohol soluble fraction, the second a 50 per cent acetone extract. Corpora lutea may not be found in certain animals even after the second cycle.

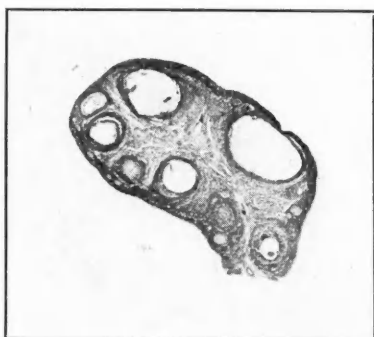


FIG. 1.—Ovary of the adult rabbit after 21 daily injections of 80 units. Note the absence of corpora lutea.



FIG. 2.—Ovary of female dog 4 days after 200 units daily. Note the absence of corpora lutea. Twin ova are seen in a single follicle.

We have noted, in our rat colony, some exceptions to the general type of cycle, which it may be of interest to mention at this time. We have had one rat which was given the equivalent of one gram of placenta daily, starting at 26 days of age, and 34 grams in weight. This animal manifested a continuous cornification of the vagina for 17 days. The injections were stopped and a state of diestrus was instituted which lasted until injections were resumed 28 days later. Cornification of the vaginal mucosa reappeared and was continuous for 12 days, at which time injections were again stopped. The animal was sacrificed 8 days later and the ovary was found to be of normal size and free of corpora lutea.

In another instance a senile rat which was studied daily by the vaginal smear method showed a continuous cornification phase. After

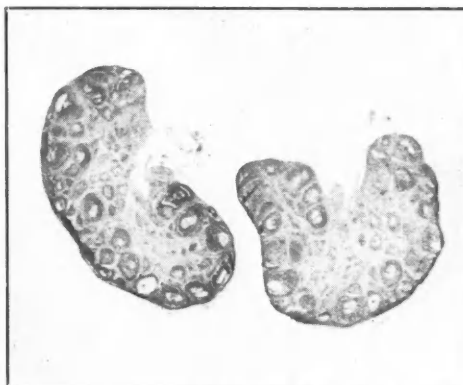


FIG. 3.—Ovaries of a rat 27 days old, 30 gm. Injected with alcohol soluble fraction in potency test. Strong positive reaction. Killed on the fifth day. Note the mild hypertrophy and wealth of follicles. Corpora lutea absent.



FIG. 4.—Ovary showing corpora lutea. Rat 28 days old; 37 gm. weight. Injected with the equivalent of 3 gm. placenta, as a relatively crude extract made by use of 50 per cent acetone.



FIG. 5a

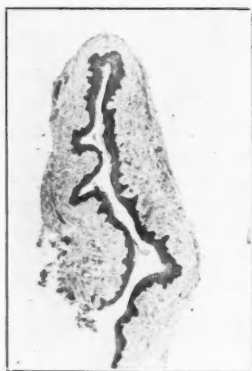


FIG. 5b

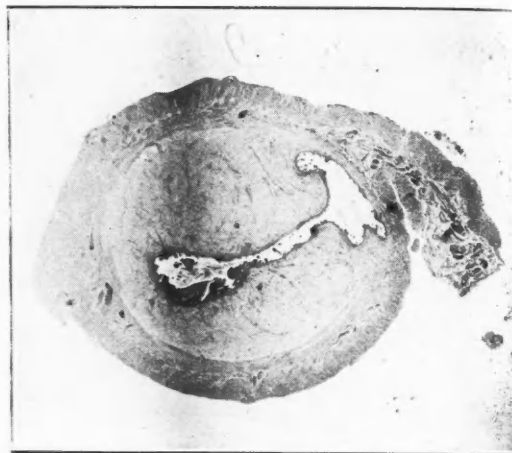


FIG. 5c

Senile rat in continuous œstrus. *a.* Ovary. *b.* Vagina. *c.* Uterus. Note cystic follicles in ovary, also hyperplasia of mucosa of uterus.

six weeks' observation the hormone was administered for one week in daily doses the equivalent of five grams of placenta. The animal continued to show daily squamous cell flushes. It was killed at the end of a week and no corpora lutea were found in the ovary. The follicles appeared cystic in character while the uterus was tremendously hypertrophied (Fig. 6).

These two rare examples of abnormal cycles in the rat are quoted because of the parallelism with certain clinical types of ovarian dysfunction which is suggested.

DISCUSSION

It has been our endeavour in this research to secure placental extracts free from œstrin, and also free from specific luteinizing factors. The active principle, while manifesting the property of a specific stimulant to the immature rodent ovary, causing it to develop to a mature state and to assume thereafter the normal cyclic function of the post-puberty state, should, we feel, be con-

sidered a pregnancy hormone. Our conception of the physiological significance of this active principle is that it is produced in the placenta throughout pregnancy for the specific purpose of assuring the continued functioning of the ovary. There is now ample evidence to show that both œstrin and the corpus luteum hormone are produced by the ovary during pregnancy and that ovulation is inhibited. That there must be other



FIG. 6.—Ovary of Rat No. 1, killed after two pregnancies. (See protocol for details).

factors, such as anterior pituitary influence playing an active part in the hormonal balance during this state, is freely admitted. Although it has been proved that the placental hormone is capable of activating an immature ovary, one may nevertheless consider such an effect as fortuitous. Accordingly, in the theory which is proposed the active principle is considered as a pregnancy principle primarily, but as an ovary-stimulating substance it may be found effective in the activation of ovaries which are hypofunctioning.

The relationship which the hormone described in the communication bears to the so-called anterior pituitary principle found in pregnancy urine cannot be definitely stated. As yet we have confined our attention to the placenta as a source of active extracts. It appears to us more than likely that the placental hormone with which we are dealing should be present in the urine. Recently Aschheim and Zondek have taken a viewpoint somewhat similar to that of Wiesner, namely, that there are two principles which act upon the ovary—Rho I and II (Wiesner), or Prolan A and B (Aschheim and Zondek). The former is considered as oestrogenic only, in that it induces oestrus in immature animals without luteinization. Our own work lends a considerable measure of support to this point of view. In our earlier work with sulphosalicylic acid extracts and with 50 per cent acetone extracts, corpora lutea were found in the ovaries of the treated immature rats, associated with the first oestrous cycle. The purified hormone, however, has not given evidence of any luteinizing action. One point which may be of considerable significance is the observation that immature animals which have been brought to sex maturity as a result of hormone treatment show after the second or a later oestrus period definite evidence of ovulation followed by corpora lutea formation.

It was only after it had been shown that the placental extracts described were non-toxic in character and exercised no unfavourable influence in normal animals that we formulated the theory as outlined above, simply as a working hypothesis. These studies also gave us ample justification to proceed with clinical experiments, the results of which have been most encouraging. Perhaps the most important practical point of the laboratory studies has been

the demonstration that this active principle is non-protein in character and is unaffected by digestive enzymes. It may therefore be administered orally.

The experience with the method of assay which has been had makes it evident that an absolute biological assay will be a matter of great difficulty. The type of method recently suggested by Coward and Burn for the assay of oestrin appears to hold the most promise. It is suggested that immature female rats three weeks of age, and not more than 35 gm. in weight, should be used. It will be necessary to use a large number of animals and to apply the statistical method of Coward and Burn to arrive at a true unit. In our work thus far only a few rats have been used at any one time, and the weight of a unit of the purified product has been found to be of the order of 0.0015 mgm. This value is not in any sense to be considered as final. It should be possible, however, at a later date, to use the purified product as a standard of reference in the standardization of extracts intended for clinical use. Absolute purity of the final product which has been described cannot be claimed until the results of further work justify such a step. However, the results which have been obtained seem to indicate that one is dealing with a pure substance.

Those workers who have attempted to obtain some measure of purification and concentration of the so-called anterior pituitary hormone in pregnancy urine have made use, for the most part, of fractions obtained by submitting concentrates to precipitation by alcohol. It is of interest to note again that the hormone of the placenta described herein is soluble in alcohol. It is altogether possible that some of this principle might be entrained or adsorbed in a precipitate resulting from the addition of alcohol to a mixture containing it. One could, however, never hope to concentrate and purify the hormone further by such methods. It is felt that if any true anterior pituitary hormone analogous in its physiological action to the pituitary implant be present in placenta, the method which we have used would exclude it even from our partially purified and concentrated extracts. It is our intention to study the physiological effects of fractions which may be separated from the precipitates and residues which have been

discarded in the preparation of the ovary-stimulating hormone described in this paper.*

We are greatly indebted to Dr. H. B. Van Dyke, of the University of Chicago, for making tests to determine the effect of the placental extract (85 per cent alcohol soluble) upon completely hypophysectomized rats. He has very kindly permitted us to quote his results, which he will doubtless publish in detail later. After two weeks of daily injections with known potent extracts, he obtained œstrus in five hypophysectomized animals. He also confirmed our results as to the absence of œstrin from the extract.

The fact that the ovary of the hypophysectomized rat has been activated by the placental extract, even though the time required was much greater than in the case of immature normal animals, is a matter of great importance. It may be viewed as evidence against the theory of placental origin of the hormone suggested in this communication. A practical point which the experiment indicates is in relation to the time required to produce the result. It is possible, therefore, that certain clinical cases of ovarian hypofunction of pituitary origin may be found to respond to treatment with the extract if the treatment is continued over some months.

The problem of standardization of the extract is a very formidable one. Lately we have found that spontaneous œstrus may occur in untreated control animals as early as twenty-six days of age. It becomes necessary, therefore, to use animals in assay work which are of such an age and weight as practically to exclude the possibility of obtaining positive results in controls. Very young rats are relatively insensitive to the hormone in our experience. Also, it has been very difficult at times to obtain clear, positive œstrus smears in rats of less than twenty-five days of age and weighing under 35 gm., even when they have been injected with known potent extracts. A phase of cornification may be obtained, but leucocytes are usually present. It is necessary, then, in many instances to confirm by post mortem and sectioning of the vagina what might be termed doubtful vaginal smears. It is possible that one may be dealing with a seasonal condition. We are desirous, however, of emphasizing the pitfalls in the biological assay, because we

doubt if all who have worked in this field fully appreciate the conditions.

It is to be hoped that some satisfactory solution of the problem may be arrived at by the use of special diets or by the removal of the pituitary or thyroid gland from adult animals, with a view to rendering them acyclic.

For the moment we feel that extracts prepared by rigidly followed methods present a lesser degree of variability than does the rat assay test. The extracts which have been used clinically have therefore been appraised in terms of grams of placenta per cubic centimetre. The rat tests on these extracts have shown a variation of from one to three units per gram of original placenta.

The ultimate solution of the problem would seem to depend on the production of large amounts of final product, and a rigorous assay of this material by the use of a large number of standard animals.

The name "Emmēnin", suggested by Prof. A. B. Macallum, is proposed for the placental hormone described in this paper.

SUMMARY

1. Methods of preparing active extracts of an ovary-stimulating hormone derived from placental tissue are described.
2. Physiological studies with the hormone are described and a theory is suggested that the hormone is of placental origin.
3. The name "Emmēnin" is proposed for the hormone.

It is a great pleasure to acknowledge the great help that my colleague, Dr. D. L. Thomson, has given. I am deeply indebted to him for the survey of the literature which forms an integral part of this paper. I wish also to acknowledge the technical assistance of Mr. M. McPhail and Miss J. Williamson, who were responsible for the daily examinations of large numbers of the experimental animals. Prof. F. E. Lloyd has very kindly allowed us to use his photographic apparatus and has given us his personal assistance, for which we wish to thank him.

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* See special note on p. 774.

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NOTE

[The following details were received too late for incorporation in the body of the paper.—ED.]

It is of interest to note that an active fraction has been obtained from the precipitates removed from the original acetone extract of human placentas during the alcohol fractionation processes. This active fraction has been precipitated from aqueous solution between the ranges of 65 to 85 per cent concentration of alcohol. It has been further purified by repeated solution in water and reprecipitation by alcohol. Other methods are also being tested.

The physiological properties of this extract are such as to indicate that it contains a hormone or hormones distinctly different from emménin. The chief physiological property of this active fraction appears to be that of a stimulant in the female to hypertrophy of the ovary, and in the male to hypertrophy of the seminal vesicles and associated glands. The hypertrophy of the ovary is due, for the most part, to the formation of corpora lutea. The effects of long-continued administration of this

particular extract are now being studied along the same lines as has previously been done with the emménin extract.

The chemical properties of this active fraction suggest that the hormone is of protein-like nature. Boiling of the extract has been found to result in marked loss of potency and the effect of oral administration in the dosage which has thus far been used has been negligible. A puzzling fact which will need further elucidation is the production of œstrus phenomena in the immature rat associated with the first appearance of corpora lutea in the ovaries following treatment with this luteinizing extract.

The active fraction with properties as outlined above may be readily prepared for subcutaneous administration. One realizes, however, that the use of this particular hormone can be undertaken only with the greatest of care until more is known about the ultimate effect which it will produce. There is a possibility that over-dosage phenomena may be encountered and that actual harmful end results may be produced.

The physiological properties of this luteinizing hormone are quite similar to those of the so-called anterior pituitary principle of pregnancy urine, and it is our opinion that this principle also is derived from the placenta.

We would like to emphasize that the data which have been submitted have been obtained by the use of extracts of human placentas, and we are not at all satisfied as yet that similar findings can be obtained by the use of extracts made from animal placentas, such as those of the cow or pig. The fact that certain workers have been unable to obtain the Aschheim-Zondek reactions from the pregnancy urine of these animals³⁰ may be of significance in this connection.

It has been suggested to the writer in certain criticism which has been made of our results, that œstrin or "theelin," as Doisy has now named the ovarian hormone, has not been entirely removed from our extract, and that the œstrus effects which have been obtained by its use may be attributable to traces of this hormone. Due to the consistent negative results which extracts of human placenta have given when tested on oöphorectomized animals, it was felt that this interfering factor had been adequately controlled. Larger doses will have to be given in the œstrin assay, over longer periods of time, to make this point clearer.

SOME OBSERVATIONS ON THE THYMUS IN EARLY INFANCY

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IN the year 1928 we examined radiographically the chests of 100 infants, born in the Maternity Department of St. Michael's Hospital, with reference to the thymus gland. Our object was to determine the limits of variation in the thymus-chest ratio of the normal infant, so that we might, if possible, be able to infer with greater accuracy the presence or absence of symptoms from the appearance of the thymus shadow on an x-ray plate. This study of the normal was amplified in 1929 by a second series of 119 cases, 33 of which were rayed on two or more occasions, to determine any variation in the size of the thymus occurring in the first few days of post-natal life.

The voluminous literature was reviewed and despite the acknowledged confusion on the subject, certain items appeared to be held in more or less common agreement. It is for the purpose of crystallizing the available information and of adding to it the small amount of data we have gathered that this article is written.

GROSS ANATOMY

The thymus is situated in the anterior mediastinum in contact with the sternum in front, while posteriorly it lies on the right auricle and may touch the œsophagus and the trachea at its bifurcation. It is in close relationship to the vagus, recurrent laryngeal and phrenic nerves, and is adherent to the left innominate vein. Its capsule is usually attached to the pericardium posteriorly. It derives its arterial supply chiefly from the internal mammaries, with branches from the pericardial vessels, and has a free lymphatic drainage to the retro-sternal lymph nodes. Its average weight at birth, according to Hammar, is 15 grm. The figures given by various authors however, vary considerably.

Grossly, the organ is more or less bilaterally symmetrical, presenting usually two equal lobes, subdivided into lobules. It is encased in a capsule which dips in between the lobules and

is composed of cortex and medulla. Not infrequently—in about 20 per cent of cases—the gland is either unilobed or trilobed. In about 10 per cent of cases it is conglomerate. (No-back). These varieties, according to Piersol, merely indicate variations of the fibrous septa.

HISTOLOGY

The cortex is rich in lymphocytes, while in the medulla, in a rather loose cell network, a lymphoid type of cell is found, forming the characteristic Hassall's corpuscles. In the opinion of Hammar, these corpuscles are derived from the reticular cells of the medulla and are consequently of epithelial origin. Crotti observes that mitotic figures are seen in the cells of the cortical substance in old age, which would indicate a continuance of function even at that stage of life. The vascular supply is rich, and engorgement of the vessels may at times contribute to the enlargement of the gland. The capillary network has little supporting tissue in and about the individual lobules so that hæmorrhages readily occur.

Involution.—Hoskins notes that, relative to the general body weight, the thymus is seven times larger at birth than at puberty, an observation which would point to a definite and important function of the gland in the infant. It increases in weight, according to Crotti, during the period of growth, attaining a maximum size at puberty. It then undergoes involution but never entirely disappears. Some observers have reported an increase in weight occurring after puberty, probably due to an increase of connective tissue and fat deposition.

The weight of the gland at birth, according to Hammar, averages 15 grm., increasing to 35 grm. at puberty, and returning again to 15 grm. by the age of fifty. More recent work done by Scammon has served to corroborate Hammar's results, Scammon's figures being 14 grm. at birth, 32 grm. at puberty, decreasing with age.

He has also shown a parallelism of growth of the thymus and mesenteric lymph nodes, concluding that, as indicated by weight, the thymus acts as a lymphoid organ.

It has long been accepted that the thymus undergoes a post-puberty involution, but, as Hammar and Hoskins both point out, the relative weights in the child and adult have been based on estimates made from autopsy specimens taken from patients who have died of wasting diseases which of themselves produce atrophic changes in the gland.

FUNCTION

Passing from theory to theory the last analysis yields only a filtrate of uncertainty as to the function of the thymus gland. The well-known experiments of Park and McClure on the effect of extirpation of the thymus in young dogs resulted in a doubt as to whether there was any definite effect that was due directly to removal of the gland. No indication of abnormality in the skeletal structures was noted, no tendency to developmental changes in musculature, strength, activity or intelligence, no change in hair or teeth; nor were they of the opinion that any effect was produced on the glands of internal secretion. The authors conclude that the thymus in the dog is not necessary to life. The slight changes reported, such as the retardation or diminished growth of the skeleton, slight hyperplasia of thyroid, hypertrophy of suprarenals and retarded development of testes, they believe to be due to various factors coincident with the severity of the operation performed on the animals and their subsequent confinement.

Hammar's experiments on extirpation of the thymus in frogs and Pappenheimer's on young rats produced no constantly demonstrable physiological or pathological changes. Soli's isolated observation on thymus extirpation in pullets is of interest in view of the possible rôle played by the thymus in calcium metabolism. It happened at intervals that the birds would lay eggs without shells or with very thin shells, indicating a relationship in birds between the thymus and ova.

Extracts of thymus were reported by Swale Vincent to result in no specific action. A depressor effect noted by him and other workers is thought to be similar to that following injection of many organ extracts. Injection of

thymus extract has been found to cause convulsions.

Feeding experiments conducted by Guder-snatch on tadpoles were thought to produce an increase in their rate of growth and to have delayed their metamorphosis. Uhlenhuth points out that the effect is not obtained if normal food is added to the diet, and attributes the result to improper feeding.

Henderson believes that castration in cattle causes a persistent growth and a retarded atrophy of the thymus, and thinks there is a similar effect in guinea pigs and rabbits. Crotti, in summing up experimental evidence, says: "All these observations and experiments seem to convey the conclusion that an antagonism exists between the genital system and the thymus." It has frequently been noted that in children with incompletely developed genitalia, involution of the thymus occurs at an earlier date. Hoskins on the other hand concludes that the literature affords little or no reliable evidence of any true endocrine function of the thymus. He believes that it takes part in the physiological and pathological processes of the body only by virtue of its lymphoid character, which is concerned with the bodily defense against infection. It appears that the production of leucocytes is undoubtedly a function, possibly the chief function, of the thymus gland.

Various workers are at present investigating the possibility of a relationship between the varying number of Hassall's corpuscles noted in the thymus and pathological processes apparently associated with the gland.

PATHOLOGY

As mentioned previously, the thymus is rich in vascular supply with a loose supporting connective tissue network. As a consequence, hæmorrhages are prone to occur, usually small and petechial in character, occasionally as large effusions, either circumscribed or diffused throughout the gland. Pathological studies show that petechial hæmorrhages occur very frequently in still-born children as a result of asphyxia. The hæmorrhages in these cases are usually subcapsular. A similar finding is noted frequently after difficult labours and after auto-infections. To these gross hæmorrhages Friedelben has applied the term "thymus apoplexy." It seems possible for rapid enlargement of the

gland from hæmorrhage to cause sudden death from pressure, and in a series of 13 cases collected from the literature by Wahl and Walthall sudden death occurred in seven. Such a cause must certainly be an inconspicuous factor in the production of thymic death. It should also be noted that, of the 13 cases mentioned, hereditary syphilis was definitely diagnosed in seven.

The effect of acute infections and wasting diseases is to produce a definite diminution in size. Arguing the converse, it has been stated, probably somewhat illogically, that the largest thymi are found in the healthiest children. (Morse).

Anatomical studies, such as those conducted by Noback, demonstrate that the thymus is forced back into the mediastinum by the expanding lungs, laterally and inferiorly around the heart, so that projections from the gland often extend backward to the trachea and vertebral column and in exceptional cases, downward to the diaphragm. It is evident from the material collected by Noback that when displaced sufficiently far posteriorly, the gland may cause symptoms from pressure on the recurrent laryngeal nerve or other mediastinal structures. He found definite post-mortem evidence of tracheal and even of œsophageal compression, and evidently associates compression in these cases with the result of moulding by respiration.

In support of this observation Boyd notes that most children do not develop thymic symptoms till from one month to six weeks of age, and further that these children often exhibit, together with expiratory stridor, a sort of crowing cry comparable with the brassy cough of aortic aneurysm, and probably due to pressure on the recurrent laryngeal nerve. Keeping in mind the fact that our observations in a general hospital have been practically confined to the newborn, the former statement is not in accordance with our experience, though we have no means of estimating the relative frequency of symptoms accompanying thymic enlargement in the newborn as compared with later infancy. As will be mentioned later, we have shown that moulding is usually almost completed in the first few days of post-natal life.

SYMPTOMATOLOGY

Breath-holding spasms are of frequent occurrence, and have been found by many to occupy

the most conspicuous rôle in the symptomatology. These attacks are usually occasioned by crying, the child suddenly holding its breath with development of cyanosis. The infant may then become perfectly limp and may show a transient loss of consciousness.

Dyspnœa, constant or intermittent, may occur in varying severity, with or without cyanosis, and may result in violent choking spells. Associated with these symptoms there is sometimes a crowing type of respiratory sound which has been termed "thymic stridor." There is also at times the peculiar cry mentioned above, which has been compared with the brassy cough of aortic aneurysm. Between attacks respiration may be normal or stridor may persist. Hyperextension of the head or a position of dorsal decubitus aggravates the dyspnœa. This is probably due to the combined action of the thyro-thymic ligament in elevating the thymus and to the narrowing of the upper thoracic inlet which also occurs on hyperextending the head, causing pressure by the thymus on the incompletely developed and therefore easily compressible tracheal rings of the infant or young child. The choking spells usually last but a few minutes but may endure for a considerably longer period. In rare instances the child has been known to die, but as a rule the spell subsides, respiration becomes normal, dyspnœa becomes less and an interval occurs before the next seizure.

Morgan, Rolph, and Brown have called attention to certain symptoms, which they have found associated with large thymuses, *viz.*, noisy nasal breathing, hoarse cough, attacks of syncope, restlessness and sleeplessness. They consider the method of production of these symptoms to be vagal stimulation due to pressure.

Convulsions occur at times, though this cannot in our experience be considered a characteristic or constant feature of the disease. A short preliminary tonic spasm of the muscles of the body may more often precede the attacks of pallor and relaxation previously mentioned.

It seems highly probable that certain instances of asphyxia of the newborn are directly due to large thymuses. Respiration in these cases is usually difficult to initiate and continues irregular. Cyanosis is marked and persistent. In many instances death ensues from respiratory failure within the first day. Such a case was on one occasion kept alive for over an hour in the

x-ray laboratory by artificial respiration. Breathing would be resumed after an interval of manipulation, with marked effort, calling into play the accessory muscles of respiration. Death occurred about four hours after birth. Radiographic examination revealed a markedly large thymus gland. An autopsy was not obtained.

When one recalls that the superior thoracic inlet in infants measures only from two to three centimetres it will probably be admitted that sufficient pressure might be exerted on the trachea to produce compression and death in this way. It is to the upper inlet, the "critical space of Grawitz," to which the thymus is pulled on hyperextension of the head, with resulting aggravation of dyspnoea, in cases exhibiting symptoms caused by a large thymus.

A diverse type, with which this paper does not deal, is seen in the older apparently healthy infant who suddenly becomes cyanotic, with well marked dyspnoea and stridor. After a few minutes the muscles relax, the face becomes pallid, lips livid, pupils enlarge and the child presents a picture of profound shock which may go on to death.

Probably one of the most convincing statements yet issued in favour of the mechanical theory of the cause of death is that of Chevalier Jackson whose observation, being on the living child, is doubly valuable: "On passing one of my bronchoscopes I discovered a scabbard trachea with a chink not over 2 mm. on inspiration and 1 mm. on expiration, the obstruction extending from the second to the fourth rib. The tracheal muscle was collapsed from before backward almost into contact." Permanent relief in this case followed thymectomy.

CAUSE OF SYMPTOMS, ETC.

Despite the foregoing it is nevertheless undoubtedly true that all cases of sudden death in infancy are not due to the thymus, and it is highly probable that a fairly large percentage of deaths in which the gland is thought to be implicated do not at least result from tracheostenosis. The opinion is gaining ground that the so-called "thymic death" or even the term "thymic syndrome," is undoubtedly translated too loosely to cover a number of varied conditions. It has however been the experience of every radiologist to note after radiation therapy such a consistent and marked improve-

ment in children exhibiting the symptoms outlined above, with or without radiographic evidence of large thymus, that one is impelled to the conclusion that, since radiation of the gland relieves these symptoms, a disarrangement of its function or an enlargement of its size must be responsible for their production. It seems also possible that, as frequently suggested, a toxic substance of thymus manufacture may, when associated with some type of trauma due possibly to infection or anaesthesia, result in collapse and death. Pappenheimer's reference to the marked disintegration of nuclear material as evidenced by the thymus probably pointed the way to Symmers' theory of anaphylaxis which, however, more recent experiments in sensitization have failed to confirm. Symmers holds that necrosis occurring in large numbers of germinal follicles in the lymph nodes results in the sensitization of the body by a specific nucleoprotein, and when, at a suitable period, the tissues are again subjected to the action of the same type of protein derived from nuclear breakdown in the same sort of tissue the anaphylactic reaction is completed.

In addition to the mechanical, endocrine and anaphylactic theories, the production of symptoms is by some attributed to other factors, such as sudden swelling of the gland due to engorgement with blood; laryngo-tracheal reflex; vessel rupture in the substance of the thymus. With the exception of the mechanical and endocrine theories, all have been practically discarded. Wahl and Walthall, while admitting the possibility of large hæmorrhages of diffuse or localized type due to the small amount of connective tissue supporting the capillary network in and about the lobules, consider it questionable whether death results from rapid enlargement of the thymus from that cause. A few such cases have been reported, mostly in syphilitic infants, following on the hyperæmia associated with simple hyperplasia, the pathological specimen presenting the appearance of a hæmorrhagic infarct. Cases of this nature are undoubtedly rare.

It is of course understood that thymic enlargement may exist as an entity, without associated changes of the general lymphatic structures of the body and arterial hypoplasia, commonly referred to as status lymphaticus,

with which this paper is not meant to deal in detail. In this connection the recent observation (Boyd) that the condition described by Paltauf as status lymphaticus represents the normal thymic and lymphoid tissue of the well nourished child, affords at least a fair example of the present state of flux of medical opinion on this matter. Symmers, describing a series of 118 cases of status lymphaticus, states that the thymus was hyperplastic in every instance, which would argue that the finding of a large thymus shadow radiographically should suggest the presence of status lymphaticus and contraindicate surgical procedures though other features of the disease were absent.

It may be stated here that it is our experience that, associated with thymic enlargement, certain pulmonary complications may occur, namely, pneumonia and atelectasis. The former is frequently an accidental occurrence and may result from long second stage labours with premature rupture of the membranes. Its typical clinical and roentgenographic appearance is not often subject to misinterpretation. Atelectasis, on the other hand, is more difficult of detection both clinically and radiographically, and is not infrequently associated with, and is presumably a direct result of large thymus, the presence of which is sufficient to prevent expansion of large or small areas in the parenchyma of the lung. It seems beside the question whether death in these cases results, as has been reported (Cortelle), from atelectasis or from some other mechanism of thymic origin.

TECHNIQUE OF RADIOGRAPHY

The child is placed prone on the cassette at a focal skin distance of 30 inches, using 30 M.A., 80 K.V., and $\frac{1}{4}$ second exposure. In each case care must be taken to accurately centre the target over the thymus, as it has been found that even small variations of the angle of the incident rays produce distortion of sufficient magnitude to destroy the value of comparative measurements. Even a slight lateral deviation of the tube has the effect of shifting the central shadow toward the opposite side, producing an effect simulating enlargement of one or other lobe. A shift in the sagittal plane is of lesser importance but tends to produce an obliquity of the costal shadows

sufficient to render accurate measurements more difficult, and comparative estimations at times impossible, more particularly where a series of plates is made of a given case and a variation of even a few millimeters is of importance. A point one inch below the sternal notch was chosen as a routine in our series, and films were excluded in which the technique was not beyond question. A three-inch cone, ten inches long, was employed. As an impulse timer was not used, slight variation in film density resulted but this was not sufficient to be a factor of importance in measurement.

THE AVERAGE THYMUS SHADOW

In 1928 a consecutive series of 100 children born in our maternity department was studied, and from the series were excluded prematures and all cases presenting symptoms referable to the thymus. Of the remainder, 74 cases, accurate measurements were made.

On account of slight variations in the obliquity of the ribs, even in normal cases, measurements were made at the level of the third thoracic vertebra rather than at any fixed point on the lateral chest wall. Measurements were made of the total transverse diameter of the gland and of the external diameter of the chest at the same level and a ratio established between the two. Unilateral enlargement of a lobe provides a weak point in the clinical application of measurements taken in this way, as we have at times seen a large lobe on one or other side, while the total transverse diameter of the thymus was within normal limits. Occasionally, also, the gland may be widest above or below the third dorsal vertebra. Antero-posterior films have not in our experience been found of practical value, on account of technical difficulties, though claims of merit have been attached to them by others.

The smallest thymus found in the series of a full term infant measured 2.2 cm., the largest 5.4 cm., the average of all cases being 3.2 cm. Prematures, as mentioned above, were excluded from the series, comprising a separate group of twenty-two cases. The smallest of this group was 2.2 cm., the largest, 4.7 cm., the average, 3.4 cm. The average period of prematurity was 2.25 weeks.

The ratio of thymus to chest in the full time

child was as 1:2.2, (1:2.18) in the premature group as 1:2.1.

In 1929 a second series was studied, comprising 119 cases. Measurements were made in the same manner as in the first series. Of this group 76 cases were under one day old, the remainder, 43 cases, over two days, and averaging less than four days old.

The average transverse diameter of the thymus for the entire group of 119 cases was 3.44 cm., the thymus chest ratio being 1:2.1 (1:2.08). These figures check fairly well with the results from the previous series, but are probably somewhat more accurate on account of improved technique.

Further estimations were carried out in a similar way on a group of 50 consecutive cases referred to us for radiographic examination or treatment with more or less definite symptoms pointing to thymic enlargement. The age average was about the same as in our series of normals. It is of interest to note that the largest gland in the full time child in this group measured only 4.6 cm., as compared with 5.4 cm in the normals, the smallest 2.4 cm., as compared with 2.2 cm., the average being 3.4 cm., as in our series for the normal. The thymus chest ratio in this group was only slightly greater than in the normal, being 1:2.07. It would, therefore, seem that the presence of a large thymus shadow on the x-ray plate has no direct or definite interpretation in terms of pathology or clinical symptoms, and that therefore clinical manifestations should be the sole index as to the advisability of treatment. While the discrepancy between the size of the gland and production of symptoms favours the endocrine theory of thymic disease, those who uphold the mechanical theory offer the obvious and irrefutable argument that where an apparently small gland appears to produce symptoms, there actually exists antero-posterior enlargement not demonstrable in the roentgenogram.

From a study of the cases in these two series we are of the opinion that the word "enlarged" as applied to the thymus in early infancy should not be employed as a radiographic diagnosis, as it carries with it what we believe is often an erroneous impression of disease, due to its significance as applied to the heart and other organs. The presence of disease of the thymus can be determined with accuracy only by the clinician.

It would appear preferable that the radiologist report whether the gland is large or small, with a statement as to whether it is or is not above the average as to its ratio with the external diameter of the chest at a given point. The point suggested is the level of the third dorsal vertebra. The external diameter of the chest is chosen as being more readily measured with accuracy than the internal. The slight error introduced by varying thicknesses of the chest wall is negligible.

It is our opinion that a roentgenogram of the thymus in early infancy has a very limited diagnostic value, unless we are to regard all large thymuses as pathological, and we believe that such is not the case. Roentgenograms are chiefly of service when they confirm an indefinite clinical diagnosis of large thymus or in checking the reduction of the gland in cases where symptoms of thymic origin are present, the disappearance of symptoms being usually found coincident with reduction of size. X-rays are also of value in such cases as show recurrence of symptoms after a varying interval, associated with re-enlargement of the thymus. In about 10 per cent of our treated cases this has occurred, and it is of interest to observe that, in this group, reduction of the size of the gland is repeatedly accompanied by disappearance of symptoms. We have seen several cases in which the thymus has twice enlarged after reduction had been effected by radiation.

THE EFFECT OF RESPIRATION

To determine whether, as was indicated by the dissections of Noback, the thymus is moulded by the lungs in respiration, studies were carried out on a series of thirty-three newborns. These were not consecutive births, cases showing glands of 3.0 cm. or more in diameter being chosen as most likely to undergo moulding. Films were at first made in the delivery room immediately after birth and again in from two to seven days. Later it was found that very little change occurred in the first few hours of post-natal life, and the radiograms were then routinely made in the x-ray department as soon after birth as convenient. In the majority of instances changes in the transverse diameter of the thymus were observed. The average size of the thymus in this group within five hours of birth, was 3.7 cm., the average

size measured three and a half days later was found to be 3.15 cm., a diminution of 0.55 cm. A few observations made at later periods would indicate that there is comparatively little further diminution in size after the third or fourth day. The greatest decrease in diameter noted was from 3.8 to 2.6 cm., within three days. The size of the thymus at birth is no index as to its subsequent behaviour, although the change noted in small glands is less striking. A gland large at birth may remain so, or may recede to well within average limits. It is highly probable that in some cases this natural moulding or reduction in size of the thymus has been wrongly attributed to the effect of radiation.

The practical conclusion to be drawn from this series of cases is that a diminution in the size of the thymus shadow may be anticipated within the first few days of post-natal life, and that, therefore, the radiographic examination of the thymus in the newborn should be delayed, unless urgently indicated until the third or fourth day after birth.

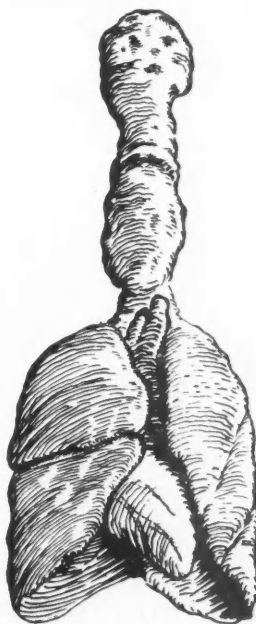
In view of this finding our two series of normal cases were re-examined and the thymus-chest ratio calculated for 73 infants, of three to seven days of age. This ratio was found to be 1:2.5. This we have established as the average ratio of thymus to chest in the normal infant of three days or older, when measured at the level of the third dorsal vertebra.

One would expect that if this decrease in the lateral diameter of the thymus were due to simple moulding and were not accompanied by actual decrease in volume that, as the antero-posterior diameter would inevitably be increased, pressure symptoms would appear in certain cases, or undergo exaggeration if already present. So far as our limited observations can be relied upon, the reverse is true, and such symptoms as stridor, noisy respiration and cyanosis are more frequently relieved after the first few days following birth. This would argue against the theory of the origin of symptoms from pressure in these cases, or else would indicate an actual decrease in the total volume of the gland during the first few days of post-natal life.

The literature affords no reference to this subject from a radiographic standpoint. The dissections of the thymus in the fetus and newborn,

performed by Noback, showed that an extension of the thymus in the posterior direction was present in 7 per cent of the individuals studied, surrounding in some cases the innominate and superior caval veins, at times causing pressure on the aortic arch and innominate artery. Noback believes that compression of the thymus by the lungs may occur in the first half hour of life and continues for about two weeks. While it is probable that moulding actually does begin immediately on initiation of respiration, we have rarely been able to measure an appreciable degree of change in the transverse diameter in that time. After three or four days we have observed very little subsequent change in the thymus shadow.

It occasionally happens that radiograms made to show the thymus uncover other information of value to the clinician. In the course of these studies a small number of cases were found which exhibited other pathological processes, included in which were one case of congenital heart disease, four of moderate atelectasis, two of bronchopneumonia and one case of congenital diaphragmatic hernia. Minute areas of atelectasis are of fairly frequent occurrence in the newborn, as shown by post-mortem examination,



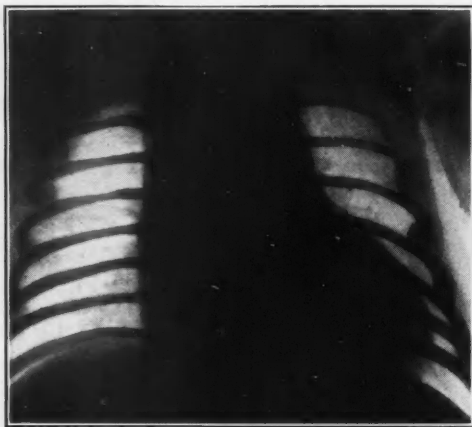
Autopsy specimen from case quoted in text, showing a cervico-thoracic type of thymus with two thick tongue-like processes reaching the inferior border of the thyroid.

but only areas of size sufficient to produce clinical signs and symptoms are in general demonstrable in a radiogram. The relationship of atelectasis to large thymus has been noted above. In the newborn we have occasionally observed consolidation of one or both bases with coincident atelectasis of the upper portion of the lungs. This may be only a chance relationship or may result from tracheostenosis. In this connection the following case is of interest:

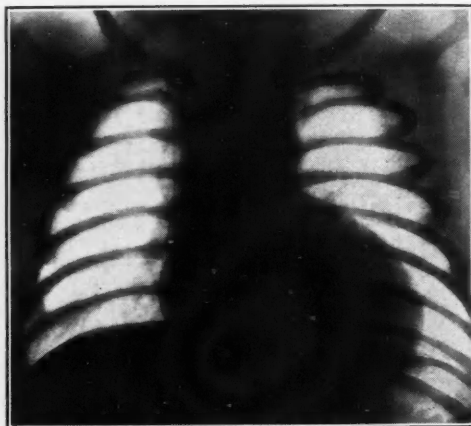
A male child, delivered of an easy labour, premature, 8 mos., weight 5 lbs. 4 oz., was referred for examination of the thymus. Respiration had been started with difficulty. Cyanosis was deep, but cleared up in a few hours, recurring at intervals for short periods. A peculiar high pitched note accompanied inspiration. The temperature at no time during the child's illness rose above 98.3°. A slight convulsive at-

tack occurred ten hours after birth. Physical examination also roused suspicions of atelectasis in the upper lobes. The bases were clear, breath sounds normal. When brought to the x-ray department the child was held in the arms and the head hyperextended. Cyanosis became deep and breathing promptly ceased and was restored only by artificial respiration. Radiograms showed the thymus shadow to be larger than the average, the thymus chest ratio being 1:1.6. There were minute areas in both uppers thought to be due to atelectasis. Radiation treatment was promptly administered. After a few hours improvement in breathing and colour were evident and the child became practically symptom free for twelve hours. Cyanosis then returned, respirations increased and death occurred on the third day. At autopsy pneumonic consolidation of both lower lobes was found. Minute areas of atelectasis were present in both uppers. The thymus was relatively large and presented two thick tongue-like processes, extending upward along the trachea through the superior thoracic inlet to the lower border of the thyroid gland.

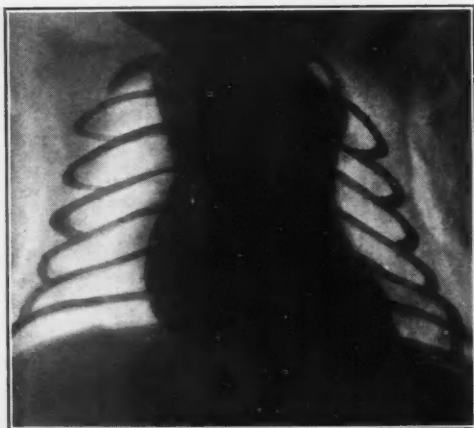
The immediate cause of death in this case was



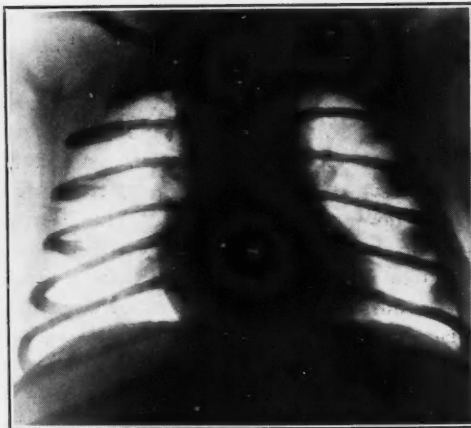
CASE 1.—No. 1.—Baby A.—Age 3 hours. The transverse diameter of the thymus at the level of the third dorsal vertebra measures 3.8 cm.



CASE 1.—No. 2.—Baby A.—Age 3 days. The transverse diameter of the thymus at the level of the third dorsal has decreased to 2.6 cm., a diminution of 1.2 cm.



CASE 2.—No. 1.—Baby W.—Age 5 hours. The transverse diameter of the thymus measures 4 cm.



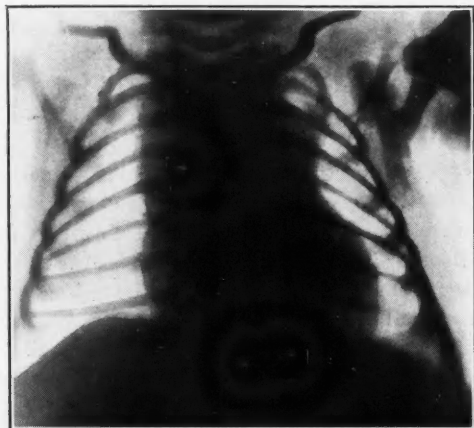
CASE 2.—No. 2.—Baby W.—Age 6 days. The transverse diameter of the thymus shows a decrease to 3.6 cm., a difference of 0.4 cm.

evidently a pneumonia which developed apparently during the second day. The rôle played by the thymus is thereby obscured, but it is certain that the cervico-thoracic type of gland found at autopsy lent colour to the clinical picture of large thymus. In the newborn the cervico-thoracic type has been reported in over 80 per cent of cases (Noback). It is possible that under aeration from tracheostenosis was the initial factor in the production of the pneumonic process observed in this instance.

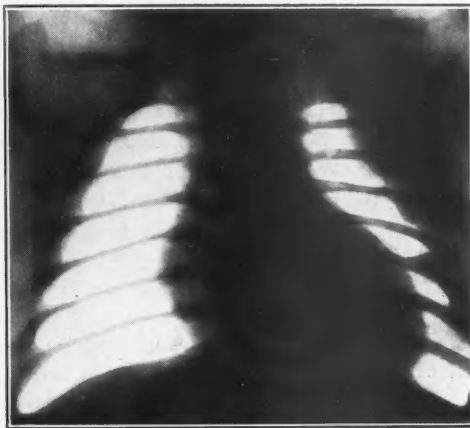
RADIOGRAPHIC DIAGNOSIS

There is comparatively little difficulty attending the recognition of the thymus shadow in plates of the infant chest. The so-called pedicle type, in which the thymus shadow merges with

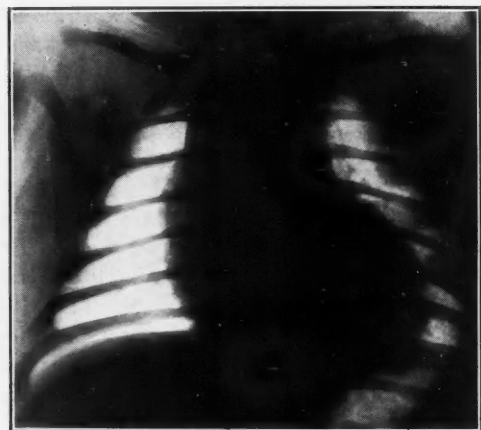
that of the heart, may be missed or interpreted as due to cardiac enlargement. The superior vena cava is said at times to complicate the picture by causing broadening of the median shadow to the right, especially in young infants, during crying or struggling. We have experienced no difficulty in this way. Atelectasis is usually easily recognized. Enlarged mediastinal glands are not encountered in very young infants and in older children cast a shadow easily differentiated from that of the thymus. In this connection an observation by Mosher, MacMillan, and Motley is worthy of note. In a series of 90 children examined in the Peabody Home for Crippled Children, a tuberculosis sanatorium, only 7 per cent showed a broad mediastinal shadow. A series of routine examinations con-



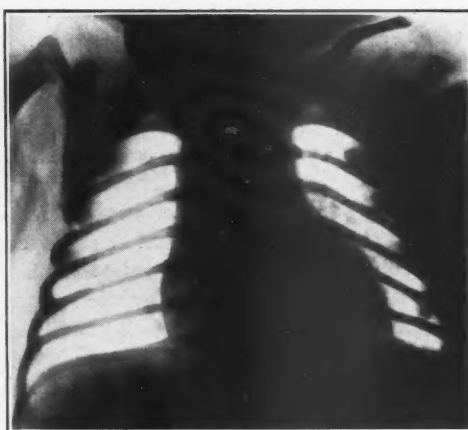
CASE 3.—No. 1.—Baby M.—Age 5 hours. The transverse diameter of the thymus is 3.9 cm.



CASE 3.—No. 2.—Baby M.—Age 3 days. The transverse diameter of the thymus has diminished to 2.6 cm.



CASE 4.—No. 1.—Baby N.—Age 10 hours. The diameter of the thymus is 3.4 cm.



CASE 4.—No. 2.—Baby N.—Age 4 days. The diameter of the thymus has decreased to 2.6 cm.

ducted by the same authors elsewhere established 7 per cent as their average incidence of enlarged thymus, by which they mean a gland larger than the vertebra lying behind it. The children in their series ranged from a few months to 16 years of age.

TREATMENT

The actual technique of radiation does not materially matter so long as it is efficient in reducing the size of the thymus and is not unnecessarily heavy. The field should be as restricted as possible, in order to avoid injury to the surrounding lung tissue, though positive evidence of any such untoward reaction resulting from radiation of the thymus has never, we believe, been produced.

We have found it convenient to tape to the skin a small protective rubber with cut-out aperture, with a cradle-like rest to support additional protective material. We employ a target skin distance of 10 inches at 90 K.V., 5 M.A., using a filtration of 4 M.M. aluminum. Treatments are given alternately anteriorly and posteriorly over the chest for four doses, at weekly intervals. In one month plates are made and the thymus, in about 90 per cent of cases, is sufficiently reduced in size to make further treatment unnecessary.

It has been our experience, in common with that of many observers, to note a marked improvement in symptoms even a few hours following radiation, though decrease in the size of the gland may not be measurable for days, a fact difficult to explain on the basis of the pressure theory of symptom production. Our records show some cases requiring two or even three series of treatments.

In a small percentage of cases the gland has become large again after having been reduced in size by radiation and further treatment has usually been again successful in controlling this regeneration. As a rule, irrespective of the size of the thymus, radiation has been continued till symptoms have disappeared or have been modified to a satisfactory degree from the standpoint of the clinician. We do not hesitate to treat a thymus well within normal limits as to size, for, as has been frequently mentioned, we are not certain that symptoms may not result from a dysfunction of some type, or from antero-posterior enlargement not demon-

strable radiographically. In either case radiation is justifiable. Moreover, the radiation of itself constitutes a therapeutic test, and we may, I believe, conclude definitely that if symptoms do not clear up after adequate treatment by radiation the thymus gland is not the causative factor in their production.

LATE RESULTS OF TREATMENT

Barnes, in a recent article, has carefully analyzed the result of treatment in a group of 63 children who had received fairly heavy radiation for definitely "enlarged" thymus from three and a half to eight years previously. He reports that the study of this group of cases "fails to demonstrate any constant deviation from normal, in either the physical or mental spheres, which might be attributed to the treatment." A survey of this kind has not been made by us, but is entirely in accord with our own experience.

CONCLUSIONS

1. Examination of 119 infants of varying ages, 76 of whom were under one day, 43 averaging slightly under 4 days old, showed a thymus chest ratio of 1:2.08, the ratio being between the transverse diameter of the thymus at the level of the third dorsal vertebra and the external transverse diameter of the chest at the same level.
2. Fifty infants of about the same average age, referred with clinical signs of thymic disease, showed a thymus chest ratio of 1:2.07.
3. Therefore we believe, that the presence of a large thymus shadow on the x-ray plate has no direct interpretation in terms of disease or clinical symptoms, and that clinical manifestations should be the sole index as to the advisability of treatment.
4. A study of 33 infants whose thymuses at birth measured 3 cm. or more showed an average diminution in the transverse diameter of the gland of 0.55 cm. in the first three and a half days of post-natal life. The most marked decrease in size observed was from 3.8 to 2.6 cm., within three days of birth.
5. Therefore the radiographic examination of the thymus in the newborn should be delayed, unless urgent symptoms are present, until the third or fourth day after birth.
6. A study of the chest films of 73 infants of from three to seven days of age, showed a thy-

mus chest ratio of 1.25. This we believe to be the average in the normal infant over three days of age. We wish to emphasize, however, that the knowledge of this ratio is of very limited diagnostic value.

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LIVING SUTURES IN RECENT FRACTURES OF THE PATELLA*

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GALLIE and LeMessurier¹ have shown that strips of fascia when applied to bones heal in a manner similar to that which occurs when tendons are transferred to new insertions. They also state that the most useful and surest method of fixation is to pass the end of the transplant through drill holes in the bone, and they advocate the use of the living suture in "certain ununited fractures". Following this argument, it occurred to us that if fascial sutures could be used in ununited fractures they could also be used in recent fractures, particularly those of the patella where the possibility of early movement lessens the period of convalescence. The fact that the living suture is non-absorbable and is not exposed to the necessity of removal, would tend to prevent future separation of the fragments if the union were of a fibrous nature.

Eight cases of fractured patella in Dr. Archibald's clinic at the Royal Victoria Hospital have been operated upon by the writer since 1927. Fascial sutures from one-half to three-quarters of an inch in width were used for them all. In some instances the fascia was obtained from the same leg as that in which the fracture had occurred, the suture being removed by enlarging the patellar incision upwards on the outer side of the thigh. (See Fig. 3). In other cases the suture was obtained from the opposite leg. The fragments were fixed in apposition by

running the fascial strip through drill holes in the bone, (see Fig. 1a), the needle then being introduced through the free end of the fascial suture. The latter was then drawn taut, and the remainder of the suture employed for bringing the edges of the capsule in apposition (see Fig. 1b). Chromic gut was used to fix the loose end of the fascia to the capsule. At the conclusion of the operation no attempt at fixation of the knee joint was made, the dressing being kept in place by a gauze bandage. At the end of 48 hours the patients were encouraged to flex and extend the leg. A summary of the case reports follows.

CASE 1

F. M., aged 67, who had suffered an indirect fracture of the left patella; operation on August 26, 1927. He was discharged from hospital on September 17, 1927, walking with the aid of a crutch. Flexion of the knee was slightly less than a right angle; complete extension was possible. The patient was seen nine weeks after operation, when both flexion and extension were 100 per cent, and he was able to walk without any support and had resumed work, which was that of chef. (See Fig. 2).

CASE 2

C. P., aged 32, a clerk, with indirect fracture of the left patella; operation on December 2, 1927. He was discharged from hospital on December 24, 1927, walking with the aid of a crutch. There was flexion to a right angle; extension was complete. He returned to work seven weeks after operation, and was seen a week later when flexion and extension were complete, and he was walking without support. Figs. 3 and 4 show the degree of extension and flexion in this case two weeks and four days after operation, and Fig. 5 the bony union.

CASE 3

F. O., aged 40, with indirect fracture of the right patella; operation on April 21, 1928. He was dis-

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charged from hospital on May 10, 1928, walking with the aid of a cane. Flexion of the knee was slightly less than a right angle; extension, 160° . Nine weeks after operation the patient had complete extension and flexion of the knee. (See Figs. 6 and 7).

CASE 4

R. B., aged 41, with indirect fracture of the right patella; operation on June 6, 1928. He was discharged from hospital on June 30, 1928, walking with the aid of a cane. Flexion in the knee was 70° ; extension, 160° . This patient did not respond to follow-up inquiries.

CASE 5

K. M., aged 64, a fireman in a steel plant, with a direct fracture of the left patella; operation on December 11, 1928. He was discharged from hospital December 29, 1928. Flexion 80° ; extension 160° . He returned to work ten weeks after operation at which time he had 100 per cent function.

CASE 6

A. L., aged 25, with an indirect fracture of the right patella; operation on November 16, 1928. He was

discharged from hospital December 5, 1928. There was flexion of the knee to a right angle; extension to 170° . This patient returned to work, which consisted of labouring on the roads, eight weeks after operation. He states that at this time he had complete function of his leg, and was able to walk a distance of five miles without any trouble. The second day after he had resumed work he slipped and sustained a refracture of the patella at the same point as the previous one. He was again operated on, when the fascial sutures were found to have broken in the middle. There was no fraying at the points where the fascial strips emerged from the drill holes. Fascial strips were again used for repair but in this instance they were much wider than the previous ones. The man returned to his labouring job in ten weeks, with perfect fixation, and so far has had no recurrence.

CASE 7

W. M., aged 14, with a direct stellate fracture of the right patella; operation on February 12, 1929. He was discharged on February 28, 1929; flexion of the knee to 70° ; extension, 180° . He was walking with the



FIG. 1—(a) Method of fixing suture (after Gallie). (b) Suture running through the patella.



FIG. 2—Case F. M. Two years after operation, showing solid bony union.



FIG. 3—Case C. P. Showing incision and 180° extension present 2 weeks and 4 days after operation.



FIG. 4—Case C. P. Flexion of 90° , 2 weeks and 4 days after operation.

aid of a cane. This patient did not respond to follow-up inquiries.

CASE 8

C. M., aged 52, a mechanic, with indirect fracture of the right patella; operation on February 24, 1929. He was discharged from hospital on March 16, 1929. Flexion of the knee was 70°; extension, 160°. Eight weeks after operation flexion of the knee was 90° and extension 170°, and the patient was back at work. No further improvement in function could be expected as this man had an old injury of the femur which prevented complete return of function.

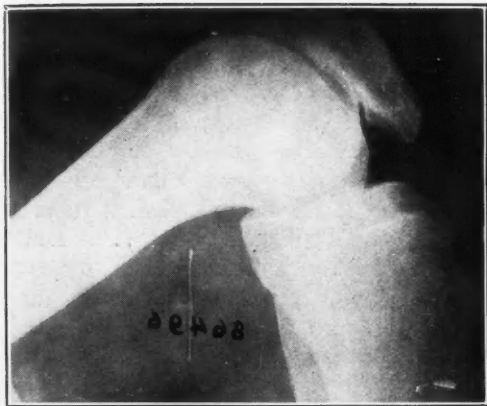


FIG. 5.—Case C. P. One year and six months after operation: bony union.



FIG. 6.—F. O. Before operation.

In one case, not here reported, an infection developed in the wound of the knee, apparently of a low grade, as it did not manifest itself until some ten weeks after the operation, at which time he had complete function. He was readmitted to hospital and drainage of the knee instituted. This eventually cleared up, but left him with limitation of flexion to a right angle

and extension 160°. The patella was apparently not involved in the infective process.

The value of fascia for repairing such fractures is evident. Its tensile strength, in the neighbourhood of 32 pounds 10 ounces per inch in width, is greater than that of chromic catgut, and the necessity of applying a splint is eliminated. Active movement can be started early, and the length of convalescence is thus shortened. While not so strong as wire, the tensile strength of which is 32 pounds for a diameter of 0.024 inches, the necessity of removing the latter in some cases overbalances the advantage of strength; and even wire has been known to break, particularly where the ends are intertwined.

The case of A.L., in which there was a recurrence of the fracture, I do not consider an argument against the use of fascia, as the nature of the injury was severe enough to have caused fracture to a normal patella.

The danger of infection due to the size of the wound can be lessened by removing the fascia



FIG. 7.—F. O. One year and 2 months after operation; bony union of fragments.

from the opposite leg. This diminishes the interference with early movement of the involved knee, and by the time the patient is ready to walk the wound has healed sufficiently to allow free movement of that leg.

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SOME OBSERVATIONS ON THE CURVE OF ELIMINATION OF PHENOLSULPHONPHTHALEIN BY THE NORMAL AND DISEASED KIDNEY*

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WITH the introduction of the phenolsulphonphthalein test in 1910, a useful test of renal function was given to the genito-urinary surgeon. It is generally admitted, however, that the test is not ideal. Some of our investigators in the field of urology¹ prefer and use indigo carmine for the purpose. Yet it is conceded by all that phenolsulphonphthalein does furnish at least a rough idea of the reserve power of the kidney.

The test, however, as generally employed, admits of certain grave errors. In cases where the first test performed indicates an impairment of renal function, subsequent tests, as done by the usual technique, may fail to detect the changes that occur during the period of treatment or observation. Kendall² states that the phthalein output is the ratio between its rate of reduction and the supply of oxygen in the body. Olivet and Prüfer,^{3,4} experimenting with dogs, have found the dye, after injection, in almost all the tissues; 30 per cent was found in the bile, some of which was later absorbed by the intestines. This fact would suggest that the liver may in part be responsible for the fluctuations which we find, unfortunately quite often, in the quantitative output of phenolsulphonphthalein.

This clinical study was undertaken as an effort to interpret the variations in appearance time and excretion, so frequently seen in the different types of renal disease, and to compare in these cases the elimination of phthalein with the corresponding retention of nitrogenous products in the blood. Our mode of approach was first to determine the curve of elimination of phthalein in normal cases by collecting the urine at half-hour intervals after the appearance of the dye in the bladder, then to use this curve as a standard with which to compare the curves obtained under similar conditions from patients with diseased kidneys.

THE PHTHALEIN TEST IN NORMAL CASES

Method of Administration and Technique

Of the three ways of administering the drug we chose the intramuscular, primarily because we wished to compare the fractional collections of phthalein with the hourly collections previously done in this department by the same methods of injection. By carefully injecting the dye deep into the deltoid muscle we have been able to obtain a fairly constant curve in normal cases. As originally proposed by Rowntree and Geraghty,⁵ a dose of 6 mgm., dissolved in 1 c.c. accurately measured in a tuberculin syringe, was used in all cases in this series. The percentage of phthalein in the urine was measured with the Dunning colorimeter. All specimens of urine were collected by means of a catheter inserted into the bladder and tied *in situ* for the duration of the test. Six hundred c.c. of fluid were given to each subject ten minutes before the injection of the dye. This appeared to insure the most satisfactory condition for a good test, as a moderate diuresis generally occurred before the appearance of the dye in the urine, thereby reducing the possibility of error in noting the time of appearance. Furthermore, Snowden⁶ and others⁷ have called attention to the fact that cases of interstitial nephritis have difficulty in concentrating phthalein and that the elimination is definitely affected by the fluid output. Prüfer leans to the idea that fluids, forced to the limit of comfort, retard the concentration of phthalein by an abnormal kidney. In view of this we have adopted the method as described and found it satisfactory as regards a half-hourly quantitative output.

Curve of Phthalein Elimination in Normal Cases

Thirty-four determinations were done on twenty-five presumably normal individuals, in whom the urine was collected at thirty-minute intervals, from the time of appearance of the dye in the bladder urine, when 6 mgm. were injected intramuscularly. Care was taken to select cases in which the blood urea and crea-

* From the Department of Urology, Royal Victoria Hospital, Montreal. Read before the Section of Urology, Ontario Medical Association, May 30, 1930.

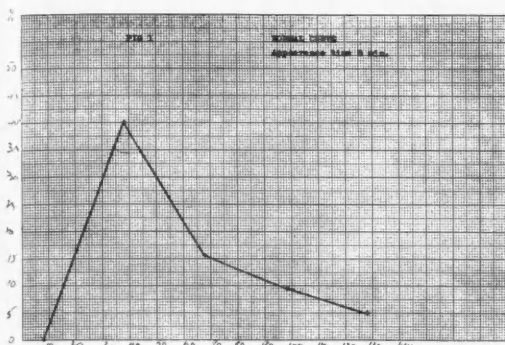


FIG. 1.—Normal curve. Appearance time 8 minutes.

time were well within normal limits. There was little variation in the curve in these cases. The average appearance time was eight minutes. The constant features were the invariable occurrence of the peak of elimination in the first thirty-minute period with an average output of 40 per cent; the rapid fall in the second thirty-minute period, with an average output of 16 per cent; and an average output in the third and fourth thirty-minute periods of 9 and 5 per cent respectively. A typical curve is shown in Fig. 1. The average ratio of elimination of the first to the second hour was 4 to 1; that of the first to the second half-hour, 2.5 to 1. Nearly twice as much dye was eliminated in the first half-hour as in the remainder of the collection period.

THE PHTHALEIN TEST IN ABNORMAL CASES

Phthalein tests with half-hour collections of urine were done on one hundred and twenty-five cases in the urological wards of the Royal Victoria Hospital. There were included in this group nearly all types of renal disease. The most important group were the cases of renal injury from back pressure and infection, following obstruction. For purposes of study we have divided those cases into two groups; the one of bilateral renal obstruction from urethral strictures and prostatism; the other of unilateral obstruction from without or within the ureter.

Cases of Renal Injury from Back Pressure and Infection Following Urethral Strictures and Prostatic Obstruction

Fifty-eight tests were done on twenty-five cases in this group. The composite curve on admission and after drainage is shown in Fig. 2. On admission the average appearance time was 15.2 minutes; average total output, 53.4 per cent; average blood urea, 0.541 grams per

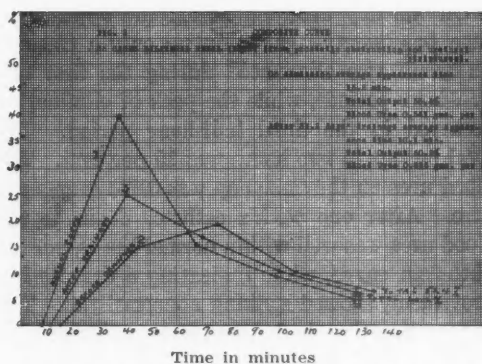


FIG. 2.—Composite curve. Twenty-five cases bilateral renal injury (from prostatic obstruction and urethral strictures).

Curve No. 1—Normal curve.
Curve No. 2—On admission average appearance time, 15.2 min. Total output, 53.4 per cent. Blood urea, 0.541 gms. per 1.
Curve No. 3—After 31.2 days' drainage average appearance time 10.1 min. Total output, 60.2 per cent. Blood urea 0.415 gms. per 1.

litre. The curve, however, is abnormal. Only 15 per cent was excreted in the first thirty-minute period with the peak of elimination in the second period. After an average drainage of 31.2 days, by catheter or suprapubic tube, or both, the average appearance time dropped to 10.1 minutes, the total output increasing to 60 per cent. The curve now tends towards the normal with the peak of elimination occurring in the first thirty-minute period. The average blood urea has now dropped to the upper limits of normal. These results coincide in the main with those of Shaw,⁷ who administered the same dye by the intravenous route, but incorporated its appearance time in the first collection period.

The curves described are the average of a group of patients, some of whom on admission had very slight renal impairment, others who suffered from acute urinary retention. Below are described two cases with the more advanced type of renal injury, and their corresponding phthalein output curves are charted.

CASE 1

C. J., aged 58, had suffered from dribbling and incontinence for five years. He had had a Neisser infection twenty years previously. He was admitted with complete urinary retention. Tongue coated and dry; temperature 99° F.; leucocyte count, 6,200; haemoglobin, 60 per cent; blood pressure, 126/60. The gonorrhoeal complement fixation test was plus. The respiratory, cardio-vascular, and nervous systems were essentially negative. Rectal examination showed a normal prostate. Urethral exploration disclosed a marked constriction of the bulbomembranous junction. A rat-tail catheter was passed and sixty ounces of turbid urine withdrawn, which contained much pus. Patient was sounded the day following his admission. Catheter drainage was instituted and fluids forced. The curves of phthalein elimination determined during the period of observation on this case are charted in Fig. 3.

On the day after admission the appearance time was twenty-eight minutes; only a trace of phthalein was eliminated during the first two half-hour periods, while the peak of elimination occurred in the third half-hour period. The total output in two hours was 15 per cent. The blood urea on the same day was 0.624 grams per litre. After one week's catheter drainage the blood urea was well within normal limits, yet the phthalein curve, while indicating a definite improvement, showed striking abnormalities. The appearance time had dropped to eighteen min-

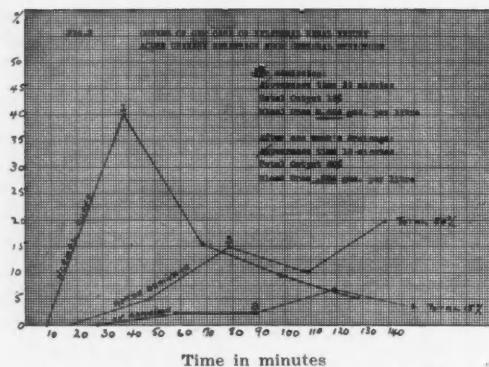


FIG. 3.—Curves of one case of bilateral renal injury. Acute urinary retention from urethral stricture.

Curve No. 1—Normal curve.
Curve No. 2—On admission; appearance time 29 minutes. Total output 15 per cent. Blood urea 0.624 gms. per litre.

Curve No. 3—After one week's drainage: appearance time 18 minutes. Total output 50 per cent. Blood urea 0.324 gms. per litre.

utes, the total output was 50 per cent, yet only 5 per cent of the dye was eliminated in the first half-hour period.

CASE 2

J. P., aged 71, was admitted with acute urinary retention. He had had symptoms of prostatic obstruction for three years, and had been under intermittent catheterization for a week. There was marked arteriosclerosis, also extra-systoles. Blood pressure, 95/60. Rectal examination showed benign prostatic hypertrophy. The bladder was percussed three inches above the symphysis. A retention catheter was inserted. The urine contained albumin and much pus (sp. gr. 1008). Phthalein curves are shown in Fig. 4.

Here again is the typical curve of renal impairment from back pressure. On the day after his admission the appearance time was twenty-eight minutes; total output 35 per cent, with a marked delay in the peak of elimination of the dye. On the same day the blood contained over one gram of urea per litre of blood. After eighteen days of catheter drainage the blood urea was within normal limits, yet the phthalein curve while showing improvement was still quite abnormal; appearance time eighteen minutes; total output, 45 per cent. After 33 days of

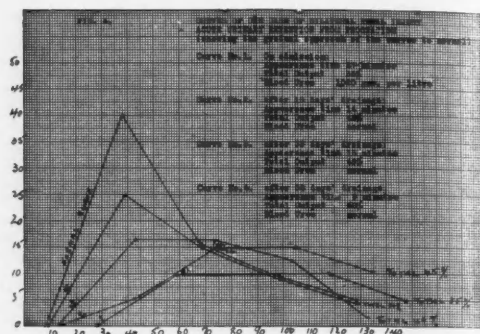


FIG. 4.—Curves of one case of bilateral renal injury. Acute urinary retention from prostatism (showing the gradual approach of the curves to normal).

Curve No. 1—On admission: appearance time 27 minutes. Total output 35 per cent. Blood urea, 1020 gms. per litre.

Curve No. 2—After 18 days' drainage: appearance time 14 minutes. Total output, 45 per cent. Blood urea, normal.

Curve No. 3—After 33 days' drainage: appearance time 13 minutes. Total output, 49 per cent. Blood urea, normal.

Curve No. 4—After 38 days' drainage: appearance time, 9 minutes. Total output, 50 per cent. Blood urea, normal.

catheter drainage and fifteen days after the patient's blood urea had first become normal, the phthalein test still showed a delay in the appearance time (twelve minutes) as well as a delay in the peak of elimination of the dye, and it was only after thirty-eight days' drainage and twenty days after the patient's blood urea had first become normal that the appearance time came to nine minutes and the peak of elimination occurred in the first half-hour period. It may be noted that during the last twenty days of drainage the total output of phthalein only increased by 5 per cent, yet each successive phthalein curve more nearly approached the normal as the reserve power of the kidneys began to re-establish itself.

Unilateral Renal Obstruction

Forty-four tests were done on twenty-nine cases in this group, of which twenty-one were cases of acute ureteral colic from calculus, the remaining eight cases being unilateral hydronephrosis of some duration. The appearance time in both those groups averaged 11½ minutes. It may be noted (Fig. 5) that the cases admitted suffering from or just after having had ureteral colic show an average output of 20 per cent in the first two half-hour periods, while the curve of the hydronephrosis tends towards the normal. Most cases with unilateral ureteral calculus have a good two-hour output, but a great many of these cases show the peak of elimination delayed to the second half-hour period. The average

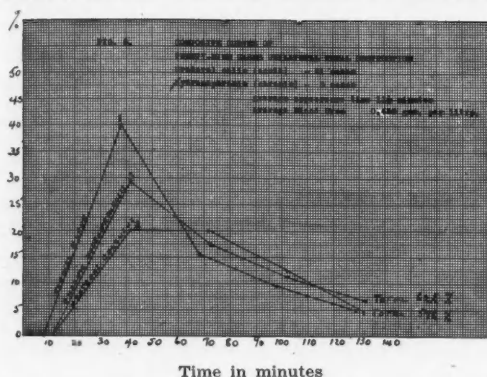


FIG. 5.—Composite curves of twenty-nine cases unilateral renal obstruction.

Ureteral colic (acute), 21 cases; hydronephrosis (chronic), 8 cases. Average appearance time $11\frac{1}{2}$ minutes. Average blood urea, 0.420 gms. per litre.

Curve No. 1—Normal curve.

Curve No. 2—Ureteral calculus.

Curve No. 3—Chronic hydronephrosis.

blood urea in this type of case was above the upper limits of normal.

Composite Curve of Three Cases of Subacute Bilateral Pyelitis

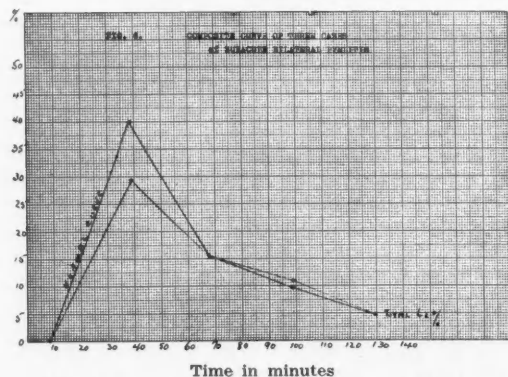


FIG. 6.—Composite curve of three cases of subacute bilateral pyelitis.

This chart (Fig. 6) is shown for comparison. The curve while showing a slight abnormality very nearly approaches the normal. The blood urea in all these cases was within normal limits.

Curves of One Case of Acute Pyelonephritis

CASE 3

L. F., male, aged 35, admitted complaining of pain across the back, frequency, hæmaturia, chills, fever and vomiting. The onset was acute and the symptoms preceded his admission by four days. Temperature on admission 104° . Pulse 140. White blood count 13,000. Blood pressure 124/66. The bladder urine contained albumin and much pus. The culture showed *B. coli communior*. The blood culture was negative, but there were many small petechial hæmorrhages in the skin. After admission, patient had severe chills and a septic temperature for a week. The temperature then gradually subsided by lysis, and his condition improved. Fractional phthalein tests were done on this case. (Fig. 7).

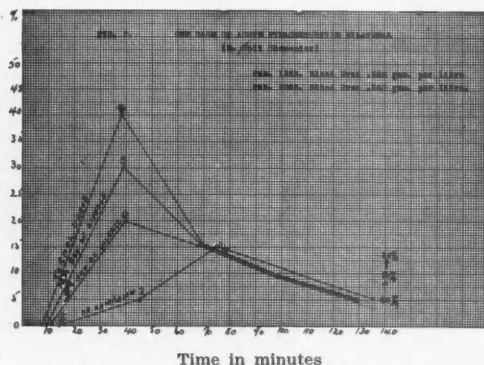


FIG. 7.—One case of acute pyelonephritis, bilateral (*B. coli communior*).

Feb. 12th—Blood urea, 0.528 gms. per litre. Feb. 20th—Blood urea, 0.340 gms. per litre.

Curve No. 1—On admission.

Curve No. 2—Fifth day of disease.

Curve No. 3—Ninth day of disease.

Curve No. 4—Normal curve.

On admission the blood urea was 0.528 gm. per litre. The phthalein appearance time was thirteen minutes; total output, 40 per cent; and the peak of elimination was delayed to the second thirty-minute period. Curves two and three represent the phthalein tests done on the fifth and ninth days after admission. In each successive test the time of appearance became less and the total output increased 10 per cent, the increase occurring in the first half-hour period.

Curves in Two Cases of Bilateral Renal Tuberculosis

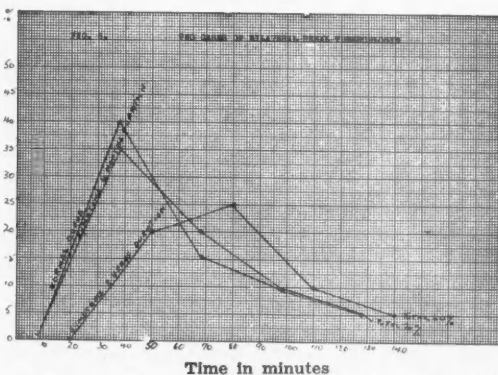


FIG. 8.—Two cases of bilateral renal tuberculosis.

In each of these cases the total two-hour phthalein output was good, being 60 and 70 per cent. It may be noted that in one case the appearance time was twenty minutes, with the peak of elimination occurring in the second half-hour period, while in the other case the appearance time was normal and the curve very nearly so. Referring to the history in these

cases, it was noted that the case with the abnormal curve had symptoms of eight years' duration, while those of the other case dated back six months. Apparently there had been sufficient renal damage in the one case to give information by the fractional method of collection, which would not be perceptible were the test done by the two-hour method. The blood chemistry in this case showed no increase.

Curves in Unilateral Polycystic Kidney

We will now conclude this series by showing the phthalein curves of a case with one polycystic kidney, the other having previously and erroneously been removed for hydronephrosis.

CASE 4

This patient was admitted with symptoms of uræmia. The phthalein test was done on admission and showed an appearance time of twenty-six minutes, with a total output of 25 per cent (Fig. 9, curve 1).

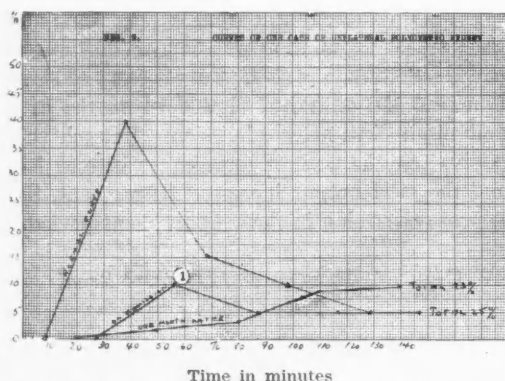


FIG. 9.—Curves of one case of unilateral polycystic kidney.

blood urea, raised on admission, continued to increase until, on the eighth day after admission, the blood contained 1.3 gm. of urea per litre of blood. After one month's treatment with hot packs and daily intravenous glucose-saline the blood urea was again within normal limits and the patient's symptoms were vastly improved. On account of blood in the urine we were unable to repeat the phthalein test until the blood chemistry was back to normal. A fractional test done at this time showed an appearance time of eighteen minutes, with a total output of 23 per cent, and with the peak of elimination in the fourth thirty-minute period. Obviously, the kidney reserve at this time was practically nil.

SUMMARY AND CONCLUSIONS

The normal curve of phthalein elimination following intramuscular injection was determined by a series of thirty-three tests on twenty-five normal individuals, in which the urine was collected by catheter at thirty-minute intervals after the dye appeared in the bladder. The

average appearance time was found to be eight minutes; the curve was characterized by an average output of 40 per cent during the first thirty-minute period, 16 per cent during the second, 9 per cent during the third, and 5 per cent during the fourth thirty-minute period.

One or more tests were performed in the same manner on seventy cases with known renal disease. All of these cases, in which impairment of kidney reserve was demonstrated by increase in the blood urea, showed definite abnormalities in the curve of phthalein elimination, and in many cases the presence of an abnormal phthalein curve indicated the true condition of the kidney while the blood urea was within normal limits. True, the blood urea was somewhat increased in certain cases of unilateral renal obstruction with a relatively high two-hour output. We think that in these cases the kidney reserve was still being maintained. Yet in this group of cases there was a tendency, when the obstruction was sudden, towards the delay in the peak of phthalein elimination to the second half-hour period. The more chronic the obstruction, the more nearly did the curve approach the normal. In the group of cases with bilateral renal damage from back pressure and infection, the striking feature was an increase in the time of appearance and a delay in the peak of elimination of the dye. As the kidneys improved, the time of appearance became shorter and the peak of elimination occurred earlier, while there was sometimes little change in the two-hour output. Regarding renal tuberculosis we have not done tests on a sufficient number of cases to justify conclusions.

The wide variation in appearance time in cases with renal insufficiency is itself enough to disprove the accuracy of the two-hour test, in which the appearance time is assumed to be ten minutes. We have found the fractional method to be practical and believe, while it is not infallible, that it gives much more information than can be obtained from hourly collections.

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THE TYPES AND TREATMENT OF ABORTIONS*

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AN abortion is taken to mean, in this paper, the expulsion of the whole or a portion of a pregnancy before the formation of the placenta.

The factors which are the causes of abortions may be divided under the following headings:—

1. General causes.
2. Local causes.
3. Those due to self-induction.

GENERAL

Any systemic or local condition in the genital tract or pelvic cavity which prevents the fertilized ovum from receiving proper nourishment for its continued growth will be a factor in the production of abortion. Abortions, then, are preceded by the death or partial death of the pregnancy. The pregnancy then becomes a foreign body and the uterus, acting in its natural capacity as a contractile organ, attempts to expel it.

Among the general causes of abortion we have those due to acute diseases, such as rheumatic fever, scarlet fever, typhoid, influenza, pneumonia and others. Abortion is not as common as was formerly taught amongst people who are suffering from the various heart, kidney and lung lesions. This may also be said about syphilis as a cause of abortion in the early months.

Developmental abnormalities of the ovum which prevent it from further growth are unusual sources of abortions. These changes are shown by imperfect segmentation of the blastoderm, by cystic change in the chorionic villi of the hydatidiform mole, and by early hydramnios. Placenta prævia is also a cause of early expulsion of a fertilized ovum, but this condition is influenced by local maternal factors

LOCAL

Under the local causes we have those due to: (1) Disturbed pelvic mechanics. (2) Tumours and new growths. (3) Infections.

Local infection appears to have very little influence on the production of abortion. The endometrium, which later on becomes the decidua, is made up of glands with their surrounding stroma, which, in the absence of pregnancy, is entirely renewed once a month. It is very difficult to find in any menstruating endometrium evidences of acute or chronic infection. In spite of the fact that gonorrhœa spreads readily, through or along the endometrium, microscopically we cannot find evidence there of its progress. Inflammation of the acute or chronic types is found in the uterus in incomplete and complete abortions, but this infection practically always appears after the abortions have commenced.

Of the *benign tumours*, the submucous fibroids prevent proper implantation of, and nourishment for, the fertilized ovum. Adenomyomata and the various polypi, on account of their structure being so similar to that of the endometrium, have very little influence on the production of abortions. Malignant tumours prevent pregnancy rather than end it.

Disturbed pelvic mechanics, as an etiological factor, is probably advanced more often than is supported by statistics. Displacements, prolapse, and lacerations may, however, cause abortions. Displacements are more often associated with a failure to become pregnant and we have all seen numerous cases of pregnancy proceeding to full term, where the cervix has been badly torn in various ways. One must remember that the internal os is the guarding gate of the uterine cavity. This usually lies one inch from the external os, but with elongation of the cervix it may lie at a greater distance. (If the inner os remains closed, the

* Read at the Academy of Medicine, Toronto, on November 7, 1929.

tendency to abortions from laceration is not great.)

SELF-INDUCED ABORTIONS

Self-induced abortions appear to be increasing in frequency. In our public wards at the Toronto General Hospital about 40 per cent of our incomplete abortions give a history of self-induction. A few of the drugs taken by mouth are as follows, quinine, castor oil, ergot, tinct. cantharidis, guaiacum, salts, lead pills, and the patent preparations such as pennyroyal and Beecham's pills, but there are many others. The results are not always satisfactory to the patient and sometimes end in definite poisoning. Most of the drugs act moderately on the uterine musculature, but lead has a definite killing effect on the syncytial and Langhans cells of the chorionic villi. Blair Bell, of Liverpool, was the first investigator to prove this action. Adami, in the same school, had previously stated that the chorionic villi cells were the most rapidly growing cells in the human body and resembled very closely the growth in malignant tissue. Blair Bell followed with further research as to the possible therapeutic value of lead in the treatment of cancer, as it was so successful in destroying chorionic villi. His paper on this subject has received considerable discussion.

There are other means employed in self-induction of abortions, such as the passage of slippery elm, catheters, knitting needles, crochet hooks and douche nozzles. This is done by the patient assuming a squatting posture with a mirror propped upon the floor in front of her and attempting to push the instruments into the cervical canal. Sometimes the instruments are boiled, but often this is not done. Strong douches of lysol, potassium permanganate, vinegar, mustard, carbolic acid and mercury bichloride are used, with the resulting caustic effects, followed by excoriation, ulceration and absorption. The patient feels that if a weak solution is a possible abortifacient, then a stronger one is more efficacious. We have had during the last five years two cases of mercury poisoning from tablets placed in the vagina. One of these died about two weeks afterwards. In the other case, sodium thiosulphate was given early by intravenous method, by mouth, rectum, and vaginal douches, with recovery.

At the present there appears to be a spreading information as to the value of potassium permanganate tablets for the production of abortion. These tablets are pushed into the vagina. There have been seven cases of this nature in the last two years in our wards. Potassium permanganate produces ulcerations, which are very slow to heal. Apparently this drug has a definite retarding influence on clotting time of the blood, and on healing of the wounds. The ulcerations are found where the drug accumulates between the cervix and the vaginal walls. Several of these cases bled so much, in spite of vaginal packing, that it was necessary to transfuse them and practically all of the ulcers had to be oversewn with catgut to stop the hæmorrhage. These ulcers may be easily missed, unless a careful examination is made.

There are, however, a great many abortions, the causes of which are impossible to find. Abdominal operations in pregnant women, where the uterus is not touched, are often followed by abortion. We know of the influence of emotional disturbances, chills, falls, and over-exertion as etiological factors. These may be explained by reflex stimuli, through the involuntary nerve supply of an abnormally irritable uterus.

Finally there are the so-called cases of repeated or habitual abortions, where evidence of any nature as to the cause is lacking. Some of these patients show a lowered basal metabolism, but this is not a constant finding.

PATHOLOGY AND BACTERIOLOGY

The earliest pathological change in abortions is due to an increasing area of hæmorrhage into the decidua basalis. Closely following the hæmorrhage, there is a separation of the chorionic villi from the uterine wall, with subsequent death of the pregnancy. The actual hæmorrhage may be due to prolonged and powerful uterine contractions, instrumentation, or changes in the walls of the capillaries and blood spaces of the implantation site allowing the blood to filter through. Organisms or toxins in the blood-stream may be responsible for these changes in the vessel walls.

Organisms can always be found in the uterine curettings, following complete or incomplete abortions, anywhere from 24 hours upwards after the signs first appear. It is questionable whether

they live and multiply before the onset of the abortion. There are two possible explanations as to the source of these organisms: (1) They may be introduced or ascend from the lower genital tract. (2) They may be carried to the uterus from infected foci elsewhere in the body.

The barriers against infection from below are the closed vaginal orifice, acid transudate of vagina with its disease-resisting organisms, the position of the cervix in the vagina, and the alkaline secretion of the cervix. With an abortion, the cervix and vaginal orifice are opened and organisms, which are always present on the moist surface of the skin on the external genitalia, are carried upwards to the uterine cavity. Once the organisms gain the cavity of the uterus, they find a very good media for the growth in the blood clot, serum and degenerating decidua. In the so-called non-infected abortions, the organisms present are non-pathogenic or in small numbers, and are easily looked after by the defensive barriers of the uterine wall. In deaths due to abortion, about 70 per cent and upwards are caused by the *S. hæmolyticus*; pneumococcus, *B. coli* and staphylococci are the other organisms found.

CLINICAL TYPES

(1) Threatened abortion. (2) Inevitable abortion. (3) Complete abortion. (4) Incomplete abortion. (5) Missed, (a) non-septic, (b) septic.

Clinically, threatened abortion is associated with a small to moderate amount of bleeding. Painful contractions may or may not be present. Menstruation or pregnancy presents the same signs and symptoms. With an inevitable abortion, the hæmorrhage and pains are more marked and prolonged. It is often impossible to make a differential diagnosis between them. In spite of the risk of converting a threatened into an inevitable abortion, a pelvic examination should be made unless the patient is under close supervision. If the internal os is dilated up to two fingers' breadth, the condition is an inevitable abortion and should be treated as such. Often more than one pelvic examination is necessary.

The relative incidence of the complete, as compared with the incomplete, variety, is very difficult to obtain. In the series reported here

it was 1 complete to 7 incomplete. A great number of complete abortions, however, do not come to the hospital. The onset of irregular cramp-like pains in the lower abdomen which may later become bearing down in character, and varying amounts of hæmorrhage occur in both varieties. In the incomplete abortions, the bleeding persists and the cervical canal usually remains open. It is fortunate that death from immediate hæmorrhage seldom occurs. Nature protects the patient by lowering the blood-pressure and thus checking the hæmorrhage. However, the period of convalescence and the ability of the patient to resist infection is directly dependent on the loss of blood. In the incomplete abortions a definite distinction should be made between the non-septic and the septic varieties. As previously mentioned, the incomplete abortions are always infected in a short time. But when the products of the dead or living organisms, or the organisms themselves, are admitted into the blood stream in sufficient quantities to produce a systemic reaction we have a septic type of incomplete abortion. This reaction is shown by a rise in temperature, increased pulse rate, a leucocytosis and a lowered sedimentation time. Missed abortions are those giving a history similar to the preceding types, but with a retention in utero of the products of pregnancy. One should always examine the expelled material, but it is difficult to find decidual tissue in early pregnancy. Wherever possible, tissue should be sent for microscopic examination. In these cases, the hæmorrhage persists, but the cervical canal closes. Occasionally small portions of the pregnancy remain and give rise later to signs of menorrhagia and metrorrhagia. These are known as decidual polypi and may be found months and years after the pregnancy. We had two cases lately, where these polypi were found five and nine years after the last pregnancy.

TREATMENT

The treatment of threatened abortion is well known and includes complete rest in bed with the use of sedative drugs, such as codeine, morphia, opium, either by mouth, hypodermically or by rectal suppositories. This treatment may have to be carried on for weeks.

Once the abortion is diagnosed as inevitable, the sooner it is completed, the better it will be

for the patient. The simplest way is to pack the cervical canal and vaginal fornices with gauze, followed by pituitrin intramuscularly. Often on removing the gauze in 24 or 36 hours, the pregnancy will be found behind it or in the cervix. If in the cervix, it can be removed with ovum forceps. Unfortunately the cases do not all end so easily and surgical means are necessary to remove the pregnancy (under an anaesthetic). This may be done with one's finger, ovum forceps or a curette. One must remember the always present danger of perforating the uterus with a curette. If the patient remains at home, packing should be tried first, but if she is in the hospital it is better to clear out the uterus at one sitting. During the operation intra-uterine irrigation with a sterile or an antiseptic solution may be used to wash out the

examination is made in the lithotomy or Sims position, and the cervix exposed by a speculum. If there is tissue in the cervical canal, it is removed carefully by ovum forceps and the cervix and vagina packed, if the hæmorrhage warrants it. We always wait a day, in the public wards, to see if any rise in temperature develops, because so many of our abortions are self-induced. Ordinarily, if one was sure of the absence of infection, one could clear out the uterus at once. Even in private cases, however, I think it is safer to wait 24 hours, packing the vagina first, if necessary, before surgically emptying the uterus. If the patient has lost considerable blood, fluids in the form of glucose solution and normal saline may be given immediately, either by the interstitial or the intravenous method. Her blood should be

TABLE I
REPORT OF ABORTIONS
Causes obtained from History and Findings

Self Induced	(a) Vaginal insertion (b) Drugs by mouth (c) Vaginal douches	47 20 4	71
Falls			7
Heart Disease			3
Overwork			3
Shock			2
Cervical Laceration			6
Syphilis			1
No cause found			173
TOTAL			262

portions of pregnancy and stimulate uterine contraction. For the last few years, after the removal of a pregnancy, therapeutic or incomplete, we have packed the uterus with gauze soaked in a solution of carbolic acid and glycerine (1-16). Glycerine keeps the gauze moist by withdrawing lymph from the uterine tissue. Post-operative fatalities have been absent for some years in treatment of the incomplete abortions in our wards. In the non-septic variety, in which there is no temperature, a careful pelvic

TABLE II
REPORT OF ABORTIONS
Clinical types admitted to Tor. Gen. Hosp. 1926-28

Threatened	(a) Pregnancy continuing (b) Completely aborted	31 9	40
Inevitable	(a) Completely aborted (b) Incompletely aborted	3 6	9
Complete		27	27
Incomplete	(a) Non-septic (b) Septic	133 53	186
TOTAL			262

typed as soon as possible and a suitable donor obtained. Those cases of incomplete abortion which show a marked anæmia should not be operated on until their blood pictures are improved.

The treatment of the septic incomplete type is of the greatest importance, because it is from this type we get those severe complications which often lead to death. The routine examination should include, where possible, a blood culture, an estimation of the sedimentation time and a culture from the cervical canal.

A pelvic examination should be carefully made, and any decidua found in the external os, removed. It is better to avoid packing unless there is considerable hæmorrhage. If the

temperature should suddenly rise after this, the packing should be removed at once.

Certain drugs, such as ergot and quinine (gr. 3, q. 4 h.) are used. Ergot keeps the uterine musculature contracted and this prevents increased bleeding and also helps to limit the spread of infection. Quinine has been shown to increase the leucocytes and possibly the red cells in the blood stream.

Fowler's position is the best for drainage and this should be accompanied by application of heat to the abdomen.

Fluids should be pushed by mouth, intravenously or interstitially. Indirect blood transfu-

a special measure in the treatment of the infection. This may be given intramuscularly (30 to 45 c.c. in each buttock) or intravenously (30 to 45 c.c.) according to the severity of the infection. We have found that patients who have had scarlet fever have a very good prognosis in puerperal and post-abortion sepsis due to *S. hæmolyticus*. This however, is not claimed as a specific measure of treatment, but, with the excellent results obtained from its use, we would strongly advise the continuance of this measure of treatment in septic incomplete abortions of the severe type due to *S. hæmolyticus*.

TABLE III

REPORT OF ABORTIONS

Treatment of Incomplete Non-Septic Type

Considerable hæmorrhage on admission	Removal of tissue from Ext. os and vaginal packing	Cured	35
Considerable hæmorrhage on admission	Removal and packing but curettage later	Cured	11
Slight hæmorrhage on admission	Curettage only	Cured	63
Slight hæmorrhage, later ceasing	No treatment	Cured	24
TOTAL			133

sions should be given when the blood picture warrants this.

Surgical measures of any kind and intra-uterine irrigation should be entirely eliminated until the temperature is normal. The only possible exception to this strict rule is when the hæmorrhage is so great that the patient's life is endangered. This exception is rarely met with and I believe that this condition may be more safely treated by transfusion and by waiting until the temperature is normal before curettage.

If the cervical smears are positive for *S. hæmolyticus* (this can be shown roughly by a direct smear examination) we have been using for over three years scarlet fever antitoxin as

TABLE IV

REPORT OF ABORTIONS

Treatment of Incomplete Septic Abortions

Moderate hæmorrhage	Routine as outlined	22	
Severe hæmorrhage. (a) Transfused 7 (b) Transfused twice 2	Routine, transfusion and surgical removal of pregnancy	9	
Moderate hæmorrhage and severe infection	Routine and scarlet fever serum	22	
TOTAL	(8 Deaths)		53

RESULTS

Positive Blood Cultures	(a) <i>S. hæmolyticus</i> (b) <i>B. coli</i> (c) <i>Staph. aureus</i>	10 1 1	12
Deaths (Moribund on Admission) 4	(a) <i>S. hæmolyticus</i> (b) <i>Staph. aureus</i> (c) Pneumonia (d) Unknown	5 1 1 1	8
Recoveries	(a) <i>S. hæmolyticus</i> (b) <i>B. coli</i>	5 1	6

The accompanying tables give a summary of the types, treatment, and results of abortions admitted to the Toronto General Hospital during the years 1927-1928.

A CONSIDERATION OF DISEASES OF THE BLOOD AND LYMPHATIC GLANDS IN RELATION TO OTOLARYNGOLOGY*

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IT is written that there abideth Faith, Hope, and Charity, but the greatest of these is Charity, so Robert Hutchinson, an eminent British physician, in aptly applying this old but familiar text to medicine, makes diagnosis a matter of faith, prognosis a matter of hope, and treatment a matter of charity (too often so), but the greatest of these is diagnosis. It is only by the intelligent interpretation of signs and symptoms that diagnosis is provided with a firm foundation. It is all important if the treatment is to be intelligent and efficient. In fact, the first part of the treatment is diagnosis, the second is diagnosis, and the third is diagnosis.

In this interpretation of signs and symptoms the otolaryngologist has frequently to deal with bleeding from the nose and throat, and altered states of the glandular system shown in enlargements of the glands, such as those of the Waldeyer ring, and the cervical neck chain. As such pathological conditions rest primarily on alterations of the blood or blood-forming organs, we judged that a study of case records showing the important and close relationship otolaryngology has to general medicine would be interesting and instructive. It must be remembered that the correct diagnosis of many obscure cases of hæmorrhage from the mucosa of the nose and throat can only be made after skilled analysis of the completed blood picture. Often only the microscopical examination of a section of the gland affected can determine the underlying disease, but even skilled pathologists frequently have great difficulty in arriving at a diagnosis, for example, in cases of infective mononucleosis with ulceration of the tonsil.

In looking through the case records of the Toronto General Hospital, those dealing with altered blood states in which otolaryngology has

a part, it seemed simplest to divide them into several main groups: one in which bleeding was a prominent factor; another in which glandular enlargement seemed to dominate the picture; and still another in which neither of these signs was prominent, to which we have given the name of the "anæmic group."

Group 1.—(a) Congenital telangiectasis; (b) polycythæmia vera; (c) myeloid leukæmia (chronic and acute); (d) lymphatic leukæmia (chronic and acute); (e) symptomatic purpura; (f) purpura hæmorrhagica; (g) hæmophilia; (h) salvarsan- and benzol-poisoning.

In congenital telangiectasis there is a history of repeated and severe epistaxis for many years or even from childhood. Gradually, weakness becomes prominent, and only then does the patient seek medical advice. By this time anæmia is very marked, the hæmoglobin being as low as 20 per cent. The clotting and bleeding times are normal, so that any necessary operation may be undertaken with safety. The diagnosis rests on the finding of reddish spider-like telangiectatic spots in the mucous membranes and skin which come in crops and fade on pressure. These spots are most commonly found on the septum in the region of Little's area and on the anterior portion of the turbinates. They are frequently on the tip of the tongue, and may be seen in the nasopharynx, larynx, and even on the tympanic membrane. Those on the septum bleed quite easily, and careful cauterization or radium therapy does a great deal for the comfort of the patient and gives the blood-forming organs a chance to recover.

The florid cyanotic individual who presents himself with a history of repeated epistaxis should have a blood examination, for if he has a red blood count considerably above normal and an enlarged spleen, he is likely to be a case of polycythæmia vera, provided that there is no physiological cause for the increase of

* From the Department of Otolaryngology, University of Toronto.

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red blood cells. The blood may even be so thick that it is difficult to get sufficient plasma for purposes of examination. Consequently, death by thrombosis is not an uncommon termination.

Not uncommonly in acute myeloid leukæmia there is bleeding from the mouth or nose, with ulcerations. The patient is very ill, with considerable elevation of temperature, and marked splenic enlargement. The glands of the neck are usually enlarged. The white blood count may not be very high, but will show a large percentage of very immature forms such as myeloblasts, and a marked secondary anæmia is present. In the more chronic forms the spleen is also very large, but there is a very marked increase in the white blood count with a smaller percentage of immature forms. Bleeding from the mucous membranes comes in the terminal stage.

Acute lymphatic leukæmia resembles an acute infection with fever, swelling of the tonsils, ulcerative angina, and cutaneous hæmorrhages. The glands of the neck enlarge and usually those of other groups, but the spleen is not very large. The blood picture with its high white blood count and large percentage of large lymphocytes makes the diagnosis clear. The acute types of leukæmia are very similar and it may be quite difficult to differentiate. However, differentiation is not important, for the prognosis in either case is rapidly fatal.

In the chronic forms of this disease small lymphocytes predominate in the blood picture, there is a general glandular enlargement, and the patient is not very ill until the later stages.

In symptomatic purpura it must be remembered that the ecchymoses and hæmorrhages from the mucous membrane are only symptoms of some underlying condition, infectious, toxic, cachectic, severe anæmia, neurotic, or mechanical. The actual cause can only be determined by a careful and complete examination of the patient, and treatment must be instituted accordingly.

Purpura hæmorrhagica is a more severe form and may be rapidly fatal, with death from loss of blood or from hæmorrhage into the brain. It differs from other purpuras in that the blood platelets are diminished in number. The bleeding time is much prolonged, the blood clot is soft and non-retractile, while in hæmophilia

bleeding time is not prolonged, the blood platelets are normal, and the clot retracts normally. The coagulation time in hæmophilia is markedly prolonged, while in purpura it is normal or nearly so. The application of a tourniquet to the upper arm results in the formation of petechiæ on the forearm in purpura but not in hæmophilia. Bleeding is most common from the nose and vagina.

In hæmophilia it is essential for a diagnosis to establish that the individual should have been subject, more or less, to bleeding from various parts of the body throughout life. Hæmophilia without demonstrable inheritance is rare, is not found in females, and is transmitted only by them.

Agranulocytic angina. A toxic patient with sore throat, fever, chills, bleeding, sloughing, ulcerations in the mouth, and with a fetid odour to the breath may be mistaken for one suffering from septicæmia, but if examination of the blood shows the polymorphonuclear neutrophiles to be almost completely wiped out, the case is likely to be agranulocytic angina.

The lesions usually begin as small superficial ulcerations covered with a greyish or yellowish exudate which on removal leaves a bleeding surface. These may enlarge and increase in number very rapidly until they become large burrowing ulcers. The most common location is on the tonsils, which are usually inflamed and enlarged, and they may become so large as to make swallowing difficult. The pillars, uvula, soft palate, tongue, lips, and even the gums may be involved. Even where the symptoms are not so marked one must be careful in giving a prognosis for the outlook is almost hopeless.

One must be careful, however, that he is not dealing with another condition associated with an agranulocytic symptom-complex, such as severe sepsis, aleukæmic leukæmia, leukæmia, pernicious anæmia, poisoning with benzol or salvarsan, and the effects of x-ray or radium therapy.

Salvarsan poisoning may produce bleeding, sloughing ulcerations in the mouth, associated with a diminution of the polymorphonuclear neutrophiles, but the history of treatment prepares the way to a diagnosis.

Group 2.—Infections; malignancy; lymphatic leukæmia; aleukæmic leukæmia; lymphosarcoma; Hodgkin's disease; infectious mononucleosis;

tuberculous adenitis; Vincent's angina; actinomycosis; enlargement of the carotid body; fibroma; lipoma; tonsillar enlargement.

Local enlargement results most frequently from focal infections by way of the lymphatics, so that the area drained by that particular group enlarged must, therefore, be searched for the portal of entry. In an adult in the absence of an obvious inflammatory focus the possibility of metastatic deposits must be considered.

Seeing that malignancy of the mouth and œsophagus is a frequent condition, the so-called "sentinel" gland in the neck in carcinoma of the stomach must be kept in mind. Glands in the lower cervical group on one side of the neck are frequently the first to be enlarged in Hodgkin's disease.

In generalized enlargement, where two or more groups are involved, the causative agent may be conveyed by the blood stream, as for example, in infectious mononucleosis, rubella, septicæmia, secondary syphilis, or bubonic plague. In this way the generalized enlargement has a definite diagnostic value.

If the glandular enlargement has arisen insidiously, and if the patient's condition generally is not acute, the probable explanation lies in the direction of such diseases as leukæmia, Hodgkin's disease, and, rarely tuberculosis and sarcomatosis.

The specific features of glandular enlargement calling for special note are : the number and distribution within the group, the size, mobility, and consistency, sensitivity, whether the glands are discrete or coalescing, and involvement of the skin, or surrounding structures. When the glands are adherent to one another or to surrounding structures it means the disease process has spread through the capsule, as it does in tuberculosis, pyogenic infection, and malignancy. In chronic cases with several groups involved, the disease is likely to be chronic leukæmia, Hodgkin's disease, or rarely lymphosarcoma. Leukæmia gives us the least difficulty in diagnosis because of a distinctive blood picture.

The chronic lymphatic type of leukæmia is characterized by generalized glandular enlargement, and a blood picture showing a high white cell count 100,000 or more, in which the great majority are lymphocytes. The spleen may also be enlarged, although a large spleen and small glands is more characteristic of chronic myeloid

leukæmia, where the majority of the cells are of the myelocytic type. The individual nodes in a group are of much the same size, mobile, discrete, soft, and show no tendency to break down or involve the skin or other structures. They are insensitive to palpation and cause no discomfort apart from their size.

The aleukæmic type shows a large glandular enlargement without a high white cell count, but with a relatively large percentage of lymphocytes, as in lymphatic leukæmia. The tonsils are often enlarged, both in the lymphatic and aleukæmic types.

In lymphosarcoma the tendency is for the glandular enlargements to be unequally transformed into large masses, the individual nodes showing marked variation in size. Their mobility is limited and there is a tendency for the whole mass to be adherent to the deeper structures. Progressive enlargement of both tonsils is more likely to be lymphosarcoma than Hodgkin's disease. Pruritus, fever, and sweating are absent, metastases are uncommon, and the spleen is not enlarged. Biopsy may be an aid in diagnosis.

Hodgkin's disease. This often begins with enlargement of the glands in one side of the neck, but it may begin in any group. The first symptom may be obstruction of the bowel, due to enlargement of the lymphoid tissue in that location, or cough, or dyspnœa from enlargement of the mediastinal glands. Swelling of the arm or abdomen may be due to pressure on the venous flow, or enlargement in the groin may simulate hernia. There is a tendency towards an orderly spread from one group to another. The glands are discrete, rather firm and elastic, not tender, and do not involve the skin, while in metastatic carcinoma they are hard, irregular, and fixed. Progress may be slow or rapid. The blood picture is not distinctive, though there is often an increase in the endothelial leucocytes. There is a great tendency towards infiltration of other organs. Fever, pruritus, and sweating are common, and the spleen is usually enlarged. Biopsy may be an aid to diagnosis, but the interpretation of the microscopical picture is often difficult. The typical picture is an increase in fibrous tissue with a disturbance in the topography of the gland and the presence of multinucleated giant cells and eosinophiles.

In these cases removal of the tonsils will not cure the glands in the neck.

Infectious mononucleosis is a self-limited disease of young adults, usually males, characterized by an acute onset with fever, malaise, sore throat, and glandular enlargement which usually begins in the neck. The tonsils are often inflamed and may be ulcerated. There is some increase in the white blood count, but the greatest change is in the percentage of lymphocytes which is very high. This confuses the condition with lymphatic leukæmia, but the acute onset with fever, sore throat, and relatively low white blood cell count makes the diagnosis. In a few weeks the patient is back to normal and all anxiety is relieved. Biopsy is likely to be very misleading as the picture is one of lymphosarcoma. As regards biopsy, Prof. Duncan Graham, Professor of Medicine in the University of Toronto, makes the following statement:

"Among clinicians the impression is too widespread that the excision of a gland for microscopic examination is essential in the diagnosis of superficial glandular enlargement. This method for making a positive diagnosis has definite limitations. Too often the clinician advises the removal of a gland for microscopical examination without realizing that it is impossible for the pathologist to differentiate by histological examination between glands from cases of lymphoid leukæmia, aleukæmia, lymphosarcoma, or certain cases of Hodgkin's disease, without a report of the clinical examination of the patient, and the results of the hæmatological examination of the blood. This information alone is usually sufficient for the making of an accurate diagnosis. The microscopical examination of an excised gland is chiefly of value in the diagnosis of atypical cases of tuberculous adenitis."

Tuberculous adenitis is most common in children and is associated with disease of the mucous membrane or enlargement of the tonsils. It is most common in districts where the milk is not pasteurized. The enlargement usually begins in the submaxillary group of glands and goes on to form large knotted masses to which the skin becomes adherent. Inflammation and suppuration may occur. Pruritus is absent and the spleen rarely becomes as large as it does in Hodgkin's disease. It is exceptional to find general tuberculous adenitis. If the diagnosis is in doubt a gland may be removed for examination.

Vincent's angina may produce marked enlargement of the cervical glands with tenderness, but the presence of deep ulceration, usually in the tonsil, in which the causative organisms can be found, will make the diagnosis. However, the

ulceration due to malignancy must be kept in mind, for the Vincent's organism may be a secondary invader here. If there is any doubt it can be settled by biopsy.

Actinomycosis may involve buccal, lingual, or pharyngeal structures. It produces ulceration and marked infiltration with secondary enlargement of the cervical glands. Diagnosis is made bacteriologically, the causative organism being a streptothrix.

At the level of the top of the thyroid cartilage occasionally there is enlargement of the gland known as the carotid body. Tumours here are at first benign but may become malignant. The situation and the fact that it is a single enlargement give a clue, but diagnosis is only made by biopsy. They may be confused with fibromata and lipomata.

A patient with a history of progressive enlargement of one tonsil or both is entitled to an examination, so as to exclude malignancy, though the enlargement may be quite innocent and due only to a chronic infective process.

Group 3.—(anæmic group).—Pernicious anæmia; secondary anæmia; chlorosis; hæmolytic jaundice; Banti's disease.

A patient presented himself with the story that for several months previous he had been bleeding a great deal from the nose and that his eyesight was becoming much impaired. Careful examination established a diagnosis of pernicious anæmia and his failing eyesight was due to old and new retinal hæmorrhages. His left vocal cord was almost stationary and there was a paresis of the internal tensor muscle. Careful examination by the medical department established a diagnosis of pernicious anæmia, and proper treatment restored his voice and larynx to normal.

Other cases have various complaints such as sore throat, sore tongue, and headache. A blood and gastric analysis will establish a diagnosis and save the futility of applying local treatment to the nose and throat.

Removal of the tonsils is not likely to bring back the loss of bodily and mental vigor to the individual suffering from a marked secondary anæmia, the cause of which may be in the rectum, neither is it likely to cure the "green sickness," or chlorosis, of young blondes who come from the factories of Europe. In Banti's disease the treatment of hæmorrhages from the

mucous membrane may be the removal of the spleen, for this condition is marked by bleeding from the mucous membrane, enlargement of the spleen, and a secondary anæmia associated with a leucopenia. In long-standing cases of hæmolytic jaundice hæmorrhage may be a prominent feature, but the primary factor in the disease is an increased fragility of the red blood corpuscles.

Not uncommonly cases with a hæmorrhagic diathesis complain of deafness or vertigo. There is no reason why there cannot be a hæmorrhage into the labyrinth as well as elsewhere and this may be the cause of the symptoms. This can only be ascertained by labyrinthine tests and blood examination.

A few typical cases, to illustrate, may be of interest.

CASE 1

A middle-aged woman was admitted to the hospital with a history of having lost a great deal of blood following the extraction of teeth. It was scarcely possible to see much of her face or anything in the mouth because of blood, and the results of styptic medication. Careful examination revealed a very large spleen and a red blood count of over 8,000,000. This was a case of polycythæmia vera.

CASE 2

A woman, aged 46, was cyanotic from obstruction to respiration, thought to be tuberculous inflammation of the larynx. Laryngeal examination revealed a normal larynx, but careful x-ray examination in the lateral position disclosed a very large mass in the mediastinum. The case was believed to be Hodgkin's disease. X-ray therapy reduced the mass and the respiratory distress disappeared.

CASE 3

A young man, aged 23, was sent to a sanatorium for investigation of the lungs, because of fever, pallor, and loss of weight. On arrival, he developed pain and swelling in one cheek, and involvement of the maxillary sinus was considered. The otolaryngologist was suspicious of a blood dyscrasia. He was able to palpate

a markedly enlarged spleen, and blood examination revealed an acute myeloid leukæmia.

CASE 4

Another man, in an important position, was seeking relief from progressive weakness. He also had repeated epistaxis. He had had his blood examined, and was told it was normal or even better than normal. The otolaryngologist who was consulted for the epistaxis noted the cyanotic appearance and asked for a complete blood examination. It was a case of polycythæmia vera with a red blood count of 10,000,000. Venesection, x-ray, treatment to the long bones, and the administration of phenylhydrazin reduced the count.

CASE 5

A man presented himself for examination, complaining of pain in the ear and swelling in the neck. He had large diseased tonsils, but at the base of the tongue there was a small ulcer which proved to be malignant and was the cause of his symptoms.

CASE 6

A medical student was ill with headache, fever, malaise, and sore throat. His tonsils were large and inflamed, and there was a sloughing area in the upper pole of the right. A biopsy was done and the report was lymphosarcoma. However in two months he felt as well as ever. It was a case of infectious mononucleosis.

In this paper no effort has been made to cover all the differential diagnostic points in these blood and lymph dyscrasias. It has been our endeavour to emphasize the importance of the medical examination necessary in otolaryngological patients in whom our cross-examination points to the possibility of a general systemic disease rather than a local disorder, but our consideration has not gone beyond the title of the paper. We have, therefore, made no reference to such conditions as hypertension, chronic hepatic or renal disease, uncompensated heart disease, infectious fevers, and local lesions in the nose.

We are indebted to the medical service of the Toronto General Hospital for their co-operation and for the use of their records.

ARTERIAL EMBOLISM AND EMBOLECTOMY.—In six cases of arterial embolism of the extremities reported on by Jacob Lerman *et al.*, the embolus was located in the axillary artery in one case, in the brachial artery at the profunda branch in one, at the bifurcation of the brachial artery in one, in the femoral artery at the profunda branch in two in one of which both femoral arteries were obstructed, and at the bifurcation of the aorta in one. In four cases cardiovascular disease was the underlying cause of the thrombus and in one an aneurysm of the subclavian artery; in one the cause was not definitely established. The result from embolectomy in two cases was good so far as the circulation of the affected extremity was concerned. One of these patients, however, died thirteen weeks after operation as a result of myocardial disease. The other three patients operated

on died from one to five days after embolectomy, in spite of postoperative improvement in the circulation of the extremities involved. They conclude from their observations that the success of embolectomy depends on various factors, particularly on the time elapsing from the onset of symptoms to operation and on the location of the embolus. Narcotics may mask the symptoms in embolism of the extremities, thus jeopardizing the chances for early operative treatment. The embolus is often palpable as a thickened lump and usually pulsates vigorously, the pulsation being transmitted down the occluded artery for a short distance. The irrigation of an occluded artery with salt solution after the removal of the embolus may be useful in reestablishing the circulation of an extremity.—*J. Am. M. Ass.* 94: 1128, Apr. 12, 1930.

THE METHOD OF CHOICE FOR THE CORRECTION OF HUMP NOSE*

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IN a series of previous articles I have had occasion to describe the treatment of a large number of cases of nasal deformities, either congenital, or acquired as a result of disease, trauma, or war injuries. In spite of the fact that the recent report on rhinoplasty in general, presented to the "Congrès français d'oto-rhinolaryngologie" in 1926, by Sebileau and Dufourmentel¹⁹ has covered the subject in a fairly complete manner, I feel I am justified in taking up in greater detail the question of the correction of congenital kyphosis of the nose.

The anatomy of the organ is too well known to require consideration here; I shall therefore pass on at once to describe the different methods available for the correction of nasal convexity, comparing them with each other.

In the presence of a case of hump nose, we should first of all make a complete examination of the region involved. If there is a deviation of the septum, a spur, or hypertrophic rhinitis, a submucous resection, removal of the spur, reduction of the size of the inferior nasal concha should primarily be undertaken. The pharynx, if diseased, should also attract our attention, and be dealt with appropriately. When the upper respiratory passages are normal, one must then determine the nature of the hypertrophy of the nasal osteocartilaginous framework, so as to correct it. We know that the thin hump nose can be improved by the simple procedure of removing the kyphosis, but when the dorsal prominence is somewhat large or markedly pronounced we must in addition deal with the ascending process of the superior maxilla.

Different incisions have been recommended for reaching the nasal convexity. I will recall that it was J. O. Roe,¹ of Rochester, N.Y., who was

the first to interest himself, in 1887, in the subject of the æsthetic surgery of the deformed nose. This author reached the part to be corrected by way of the vestibule.

Monks,² of Boston, in 1898, made a cutaneous antero-posterior incision below the lobule, and arrived at the septum by passing through the columella. In 1922, J. D. Lewis described under his name the last mentioned method, only increasing somewhat the size of the section.

In order to obtain a little more room, and thus to have a better view, Portmann,¹³ in 1923, published his method which consisted in making a curvilinear incision with the concavity downwards, about three centimetres long, passing below the lobule.

The same year, Gillies,⁶ of London, in order to facilitate access to the nasal pyramid, detached completely the columella from the septum, cutting it at its junction with the lip and the mucous membrane of the two sides of the nares. When this flap with its lobulated pedicle was elevated, there was no doubt that the subsequent operative procedures were rendered less difficult.

I need not consider here the cutaneous infra-glabellar incision described by Von Mangold in 1889, nor the modification of this procedure introduced by Carter, of New York, in 1910. This method of approach, now discarded, had rather for its purpose the insertion of a graft to correct a saddle-back deformity of the nose. So far as I know, it was not recommended for cases of kyphosis. Indeed, it would be contra-indicated here for several reasons that can easily be understood.

What should we think nowadays of these different external incisions? In our time, when the purpose of rhinoplasty is to obtain as perfect an æsthetic result as possible, I am of opinion that they should all be given up, at least for the

* Read before the Congrès de la Société française d'oto-rhinolaryngologie, Paris, October, 1929.

correction of convexities. Admitting that in the great majority of cases the cicatrix would be slightly visible, it is none the less true that some mark does remain, and especially in the case of women we should be very careful. I recognize however that these incisions can be indicated when one has to do with operations on the tip of the nose.

To reach the bony structure external incisions are inadequate after all, or present other disadvantages. Indeed, the sub-lobular section of Monks, even as modified by Lewis, offers a very restricted field of operation, since, practically, it only reaches the septum, causing an obstacle to the introduction of instruments, and in order to increase the room it is necessary to prolong it upon the lobule, which renders the scar still more apparent.

In view of the thinness of the integuments of the top of the nose and vestibule, even after a satisfactory infiltration with a solution of novocain-adrenalin which separates the tissues more or less, the curvilinear incision of Portmann, about three centimetres long, is very difficult to make without penetrating into the interior of the nostrils. If one can succeed in making the scalpel travel between the skin and the subjacent layer of tissue for the whole length, I admit that the space obtained is considerable, and that the operation can be controlled by the eye. If, on the other hand, the knife opens up the nasal fossæ, this external incision is not indicated, since the approach can be made by the internal route, and leaves no scar.

Gillies' method, which consists in separating the columella from the septum up to the lobule, greatly facilitates access to the kyphotic part; nevertheless it is seldom employed because of the amount of mutilation it entails.

In my opinion the ideal procedure is to operate simply by the endo-nasal route, making from the two sides an incision in the neighbourhood of the lower border of the quadrangular cartilage. This incision can naturally be made a little higher or lower according to the necessity of the particular case. It is very important to divide with the knife the periosteum of the bones of the nose over the whole length of the median line, after having separated the skin from the nasal pyramid. When the periosteum has been pushed aside, we get a field of operation amply sufficient for the most complete intervention.

Made in this way, this incision, which is so simple, leaves of course no cicatrix.

When the osteo-cartilaginous ridge is freed from the tissues which cover it, what method should one then adopt to remove it?

From the beginning of rhinoplasty Roe used the scissors. Joseph, of Berlin, who has so greatly contributed to the spreading of the knowledge of this particular operation, still uses and recommends the saw. I ought to say that many of the operators of his school in Europe and America follow his technique. Molinié,⁴ in 1912, was using the gouge and mallet, or else a guillotine of his own invention. Moulouguet,⁹ in 1922, described his retrograde plane. Two years later, Dufourmentel¹⁶ published a new method, which consisted in a basal resection of the three pillars of the osteo-cartilaginous skeleton. And, finally, Eitner, reviving Roe's idea, made use of a special short-bladed shears.

What is then the best instrumentation and the most favourable procedure for the correction of convexity of the nose?

According to my view the ordinary scissors and the Eitner's shears are not sufficient to remove a bony ridge completely, especially if it is very hard. I have had no experience with Molinié's guillotine; nevertheless I am under the impression that there would be the same objection to it that there is to the scissors, and that it is easier to obtain a perfect result simply with the gouge and mallet.

We will admit that it is less difficult to advance the gouge from below upwards than the retrograde plane of Moulouguet which cuts from above downwards. Besides this, in the case of the gouge, the operator has a better control of his instrument. Dufourmentel's method is much more laborious, traumatic and complicated than all others, for after having resected the three bases of the skeleton of the nose, it is then necessary to fracture the nasal bones at their junction with the frontal.

It remains finally to compare Joseph's saws with the double-bevelled chisel of Sheehan.¹⁰ In the skilled hands of the inventor the saws for the removal of the bony crest permit of obtaining a perfect result. As regards the cartilaginous part of the kyphosis, it is quite simply removed with an angulated knife. If we use a rasp to further correct the ridge of the nose, because of the insufficient effect produced by the

saw, one must be careful not to leave bits of bone in the field of operation, for if this detail is overlooked, we are apt to have as a result small unsightly lumps. With Sheehan's chisel, it is still easier to control the different steps of the operation, and all chips of bone cut from the top of the nasal pyramid, or from the sides, are removed with the forceps. The chisel allows one to resect exactly as much as is required, and it is not necessary to use the rasp. It is held in the right hand, and the fingers of the left hand protect the skin, while the progression of the instrument, obtained by gentle blows of a hammer by an assistant, is kept under control. These chisels being of different sizes and having a double bevel, the operator is not likely to have an over-correction, and, step by step, he removes just as much as he wishes. When the removal of the hump is completed, the periosteum is replaced towards the median line, and two strips of adhesive plaster are applied transversely over the nasal pyramid. In order further to protect the nose, it is recommended to apply a small square of gauze, and finally a copper saddle held in place by adhesive. It is not necessary to suture the incision of the vestibular mucous membrane nor to apply a dressing, and sterilization is obtained simply with an antiseptic oil or ointment.

When the convexity is not excessive, one can obtain excellent results by this method, but if on the contrary it is strongly pronounced, then it is necessary, after having removed the osteo-cartilaginous ridge, to cut on each side the ascending process of the superior maxilla, in order to diminish the width of the nasal crest. We have in this case, also, three types of instruments for this purpose.

Having made an endo-nasal incision opposite the lower border of the ascending process, and having separated the periosteum of the maxilla on the two sides, we can then use Eitner's shears to cut the bone. In this case when one has reached the upper part, in the neighbourhood of the inner canthus, we must be very careful not to injure the lacrimal sac and its attachments. We can just as well make use of the gouge and hammer, following the same technique, and taking the same precautions in regard to the lacrimal sac. I believe, however, that at this stage of the operation, Joseph's saws are to be preferred to the gouge and Eitner's shears.

As a matter of fact, with the saws we separate the periosteum from the external surface only, and the inner wall of the fractured bone continues to be well nourished by its fibrous protective tissue. More than that, it is not necessary, with this method, to do a complete section of the ascending process, and when the saw has incised the bone sufficiently it is easy to push with the thumbs this part of the maxilla towards the bones of the nose. And, finally, the movements of the saw can be better controlled than those of any other instrument whatsoever.

The ascending process being approximated to the bones of the nose, it is very important that the periosteum of the nasal pyramid be replaced properly, in order to avoid having later on a depression of the skin in the median line.

When the correction is obtained, it may happen, under certain circumstances, as when the kyphosis is very pronounced in the osteo-cartilaginous region, that a slight dilatation of the nostrils results. In such a case we should remove the lateral cartilages. Moreover, if the nose appears to be too long, we should resect the septum, following the technique I shall describe later. In this form of rhinoplasty it is unnecessary to insert sutures, and the surgeon completes his operation by applying the apparatus of his choice, and prescribing the ointment or antiseptic oil for the nasal passages.

I need only say in addition that the plastic treatment of hump noses should in most cases be conducted under local anaesthesia with a solution of novocain-adrenalin, after having given an injection of morphine-scopolamine.

I will now report the case of a patient upon whom I operated for an elongated kyphotic nose.

CASE REPORT

Mrs. A. B., aged 27 years, consulted me on August 9, 1928, for a convexity of the nose which had developed naturally with her growth.

On examination I found a nasal pyramid rather thin, terminated by a moderately pronounced hump in the median line. This prominence was slightly more marked on the left side. From the cosmetic point of view, the appendage was too long, and the lobule too low. (See Fig. 1).

By anterior rhinoscopy a slight deviation of the septum to the left was noted, which did not interfere with breathing. The right side was normal. There was nothing in the pharynx worthy of note, except a double cryptic tonsillitis.

In view of this dysplasia I suggested to the patient the rectification of her nose. Having explained to her that after the operation the nasal pyramid would appear to be longer, I proposed moreover to shorten it. She agreed only to the correction of the convexity. An

antiseptic ointment was prescribed and the date of operation fixed for August 13th.

Operation.—A hypodermic injection of morphine-scopolamine being given half an hour before the operation, the hairy follicles were cut, and the nostrils irrigated. The mucous membrane was carefully sterilized with tincture of iodine, as well as the upper lip and the skin of the nose. After having applied cocaine to the vestibule, I infiltrated internally the whole of the nasal skeleton, as far as the infraglabellar region, with a solution of novocain-adrenalin. A few minutes later an

to see me on the 18th of September for this slight correction, which was postponed for eight days.

Operation.—The asepsis of the nose and the local anaesthesia having been carried out, the columella was incised from the septum with a bistoury from above downwards. After having separated the mucous membrane on the two sides, I gradually removed small portions of the quadrangular cartilage at the lobule. I applied myself to correct the aesthetic appearance of the nasal pyramid in relation to the conformation of the face. Finally, I resected a small part of the mucous



FIG. 1.—Patient with a hump nose, before operation.



FIG. 2.—Appearance of the patient after operation.

incision was made on both sides at the lower border of the quadrangular cartilage. By means of blunt concavo-convex scissors the skin of the nose over the kyphosis was lifted. The periosteum was then cut with a scalpel in the median line, the whole length of the dorsal ridge. Having well separated it, the convexity was attacked with Sheehan's chisel and mallet. The left side, being somewhat more prominent than the right, received particular attention. In order to complete the correction, a small nodule on the quadrangular cartilage was removed with Joseph's knife, at its junction with the bones of the nose. The pyramid being very straight, the periosteum was replaced, and the cutaneous tissues were stabilised with two strips of adhesive plaster applied transversely. The operation was completed by the application of a copper saddle. Eucalyptol-oil was ordered for the sterilization of the nasal passages.

The post-operative period was normal. For a few days slight swelling of the nose was noticed, with a violet coloured edema of the eyelids. This infiltration however disappeared quickly. The patient took the opportunity of her stay in the hospital to have her cryptic tonsillitis treated, and on the 22nd her tonsils were removed under novocain-adrenalin anaesthesia.

On the 25th she returned home well satisfied with the result. However, as I had previously warned her that the nasal skeleton would appear longer after the removal of the kyphosis, she became aware of this certain optical illusion, and, influenced by her friends, she came

membrane on both sides, and placed a few silk sutures in the two nostrils with very fine needles. In order to raise the tip of the nose some stitches were laid in orthopaedic fashion, that is to say, the sutures crossing the mucous membrane of the septum were inserted in a higher plane than those of the columella, and when the ligature was completed the overlapping disappeared and consequently the lobule was drawn upward. To better stabilise this suture, it would be worth while in certain cases to insert in the septum and columella two other heavy retaining stitches. Experience has proved that one should try to obtain over-correction for when the sutures are removed, this will disappear with time. When this plastic operation was completed a dressing was applied which gently compressed the nostrils, and under the nose a strip of adhesive plaster to better maintain the coaptation. The post-operative course was uneventful, and I removed the stitches on the seventh day.

The patient, well pleased, left the hospital on October 5th. Her shortened nose is quite straight, the lobule is raised, the nostrils are narrowed, at the same time permitting easy respiration, and the woman seems younger by several years, as can be seen from the second

photograph, taken six months after the operation. (See Fig. 2).*

CONCLUSIONS

In conclusion, I may say that in my opinion the method of choice for the correction of convexity of the nose consists in the following.

1. The incision should always be made by the endo-nasal route.

2. The resection of the bony ridge should be made with Sheehan's double-bevelled chisel.

3. Finally, if there is any necessity to interfere with the ascending process of the superior maxilla, for the purpose of lessening the width of the nasal base, and avoiding the formation of a flat area at the top, we must employ Joseph's saw for the section.

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* This patient was presented at the sixtieth annual meeting of the Canadian Medical Association, at the Notre-Dame Hospital, on June 19, 1929.

URETERAL KINKS.—Gershom J. Thompson and Hermon C. Bumpus, Jr., emphasize that the mere finding of a kink in the ureter does not necessarily explain the indefinite pain that the patient has had over a long period of time, and urge that before surgical measures are employed for the correction of the kink a more careful relationship between it and the pain be established. A kink of the ureter sufficient to cause symptoms should result in retention and delayed emptying above the kink and, if long continued, deformity of the renal calices and pelvis. This can be ascertained readily by making pyelograms at intervals of five or ten minutes, and it would seem that unless stasis of urine can be so

demonstrated there is little reason to believe that the kink in the ureter is producing symptoms. The authors made pyelograms of patients who were holding a deep breath and also after respiration. A horizontal position of the patient's body was maintained at both exposures in order that gravity or position would have nothing to do with the situation of the kidney. In every case, when its position was compared to the fixed vertebrae, the kidney was found to be displaced downward by deep inspiration. In some cases, a kink was produced by the deep inspiration and the second exposure showed the ureter to be perfectly straight. They report three cases in which they demonstrated symptomless kinks.—*J. Am. M. Ass.* **94**: 771, March 15, 1930.

CHRONIC MAXILLARY SINUSITIS*

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TEXT-BOOK descriptions of chronic maxillary sinusitis are now fairly stereotyped; nevertheless it is well from time to time to compare these with our clinical experience.

The following brief observations are based on 73 cases. In the first 44 of these we performed the Caldwell-Luc operation with a nasal wall flap, which improvement Denker, in his own book, attributes to Bonninghaus. The next 19 were operated on according to Denker's modification of the Caldwell-Luc procedure, while in the remaining 10 we adopted a method of choice. Instead of determining beforehand the type of operation we deferred this until the sinus was opened. We then examined as far as possible the lining mucous membrane, noting how much of this was really diseased and the nature of the changes. According to these findings we would choose in some cases to do the Caldwell-Luc with flap and in others Denker's modification. We believe this to be a more reasonable procedure than previously arbitrarily determining the type of operation and carrying it through simply because we had it booked as such.

Removal of all the bone between the opening in the canine fossa and the apertura pyriformis generally produces no ill effects, but this is no justification for taking this considerable quantity of bone if all the requirements of the operation may be fulfilled without so doing. We believe a degree of cicatricial contraction and sinking-in can be demonstrated after a sufficient time in almost all cases where there is a wide removal of the crista pyriformis, and in one of our cases where there was a plus Wassermann test this occurred to a marked extent after a sequestrum formed in this region. We therefore believe that the Denker operation, which has become so common in chronic maxillary sinusitis and gives such splendid results, is not necessary in more than about 50 per cent of the cases where radical interference is required; that

the same good results may be obtained by the less extensive interference of Caldwell-Luc with a nasal flap, and that this choice in procedure should be made after opening the canine fossa and studying the interior.

In leading up to the points which should determine the choice of operation permit me the following preliminary remarks.

Frequency.—The increased frequency of chronic maxillary sinusitis, noted by so many recent writers, is more apparent than real. The real increase is probably in the number of observers and the amount of attention given the individual cases. Moreover, patients are trained now to seek relief earlier than formerly. Logically, one should expect a reduction in the number of cases due to greater care bestowed on all pathological states in the nose and throat. The maxillary sinuses are probably more often involved than all other nasal accessory sinuses together; this is due to their size, frequent anatomical anomalies, and unsatisfactorily placed drainage opening.

Causes.—None of our cases were primary. Not all, however, were infected from the upper air passages, for in several there was reason to believe that the sinus and nasal mucous membranes became simultaneously involved during some general infection such as influenza. The bicuspid and molar roots were responsible for a small portion. When the infection, as is usually the case, is nasal in origin one can only surmise that it is blown in or moves in by extension.

Anatomy.—Professor Kopfsch, of Berlin, in his private lectures on the anatomy of the head and neck, stressed the highly placed and therefore poor drainage openings of the maxillary sinuses as a cause of frequency of involvement and of chronicity. He pointed out that Nature did not make a mistake here for when we went on all fours these openings were ideally situated. Evidently civilization and not Nature is at fault in this instance. The anterior angle formed by

* Paper read at the meeting of the Ontario Medical Association, Hamilton, May 1929.

the facial and nasal walls with the floor is often difficult to clear up, and the posterior-superior angle is of importance, because here the only bleeding of any consequence may occur from the naso-palatine artery. It is well to remember that the posterior-superior alveolar, the middle superior alveolar and the anterior-superior alveolar branches of the maxillary nerve, in their passage through the antral walls to the teeth, often form ridges in the antrum having very thin walls. It is often very easy by too drastic curetting to uncover the maxillary nerve in its infra-orbital canal, the superior alveolar nerves, or even the roots of the bicusps and molars. Although the superior alveolar nerves are severed, if the blood supply to these roots is maintained devitalization of these teeth does not occur. The ciliated mucous membrane is very thin, tightly applied, possesses very few glands, and has practically no erectile tissue.

Types.—There were, in our series, three outstanding types of chronic maxillary sinusitis.

a. The patient had some acute nasal affection followed by an acute maxillary sinusitis. This had been properly treated for a month or two, but, due to some nasal obstruction, poor antral drainage, anatomical anomalies, the nature of the infection, or constitutional dyscrasia, had become chronic. This was by far the commonest occurrence.

b. There had been no preceding acute trouble, either of the nose or maxillary sinus, but there had been some severe sickness, such as tuberculosis, lues, or osteomyelitis, or perhaps there had been a history of caries of the bicusps or molars. The patient noticed a copious nasal discharge, perhaps only from one side, and knew that some cavity was emptying.

c. Here the patients had no idea that any antral trouble was present and complained of no symptom therefrom. They came for some other condition and in the routine examination chronic maxillary sinusitis was discovered. Many of these probably existed since early life.

Symptoms.—The subjective symptoms were altogether lacking in many cases. Whenever retention occurred, through blockage of the ostia by swelling or a polypus, pain and tension were registered. Even without retention we often found pain on deep pressure over the sinus. A large proportion of our patients complained of foul odours.

Objectively we found in the middle meatus or in the complete lower half of the nose a white, yellowish, or greenish yellow muco-purulent or purulent secretion. The nasal mucous membrane, irritated by the flow of pus, becomes hypertrophied, and polypi may form. Our observations, however, do not incline us to accept Hirsch's statement that most of the polypi under the middle turbinate have their origin or pedicles in the antrum and can be traced through the ostia. They are generally associated with chronic maxillary sinusitis of the polypoid type, but the mucous membrane under the turbinate takes on this condition due to constant presence of pus.

The copious flow of pus through the nose, naso-pharynx and pharynx results in chronic states in these cavities and many will complain of indigestion. General and focal symptoms are most likely to arise when parenchymatous changes occur and the lining mucous membrane contains infected areas. Such a purulent mucous membrane gives a constant toxic quota to the blood and lymphatic currents, regardless of the amount of free pus in the antrum. The serous and polypoid types are less to blame in this regard.

Crusts and scabs often formed when discharge was scanty and this resembled atrophic conditions, but on account of the hyperplasia could be ruled out as such. We are not inclined to believe that atrophy is as often as supposed caused by sinus disease. In all these conditions, however, routine examination of the maxillary sinuses should be the rule.

Examination.—The many methods of examination now render it a comparatively simple matter to determine the presence of chronic maxillary sinusitis. We find the greatest help in securing a detailed history from the patients.

Lavage decided the question if pus were found, but we often had a negative result when chronic maxillary sinusitis was proved to be present. This was the case if the trocar entered a large polypoid mass, or if the antrum was so full of polypoid masses that there was no room for pus, or if the cavity had naturally emptied itself.

Suction was found to be less trustworthy, for it fails to operate through many causes.

Transillumination was more useful in antral than in frontal sinus examinations. Intensity of light must be regulated for bone and mucous

membrane thickness. One cannot always judge between thickened mucous membrane and pus content by transillumination.

Roentgen-ray plates were always asked for, and gave us the most helpful information, especially after using lipiodol. We have used the screen examination with lipiodol in a number of cases to define the polypoid masses.

If, for drainage purposes, we had a good opening under the inferior turbinate, and adrenalin chloride was run or sprayed in, we were able to insert the electro-naso-pharyngoscope and gain some information concerning the nature of the lining membrane. We do not yet possess one of the new antroscopes bent at right angles. We try to feel the mucous membrane with a large, blunt-pointed probe bent in different directions, and have been surprised at the knowledge secured regarding the bone and mucous membrane.

The determination of chronicity almost always means that the only legitimate procedure is a radical operation, but we have nevertheless seen proved chronic cases of years' standing clear up satisfactorily after a few washings.

Histo-pathologically, we consider chronicity established when permanent mucous membrane changes have occurred. Practically, an acute case not cured after two months of careful treatment was considered as chronic. The results of radical interference are so satisfactory that we prefer to err, if thus it may be termed, by operating too early, for no nasal procedure is so uniformly successful. We find it helpful to try and visualize the condition of the mucous membrane in each case by remembering the changes observed in different stages of inflammation and allowing for histological differences due to situation.

The serous or oedematous inflammation of the mucous membrane in the acute stage with copious secretion may still be present during early chronic stages. Infiltration and oedema lead to blockage of the ostia, and this to venous congestion with polypoid degeneration. The antral cavity may thus be reduced to a mere slit. This is by far the most common condition found at operation. This stage passes into more or less atrophy. We have found oedematous, infiltrated, polypoid, hæmorrhagic and atrophic areas in the same antrum. The mucous membrane on one

wall—most likely, nasal or superior—may be normal or nearly normal, while the remainder may exhibit varying stages of chronicity. From this knowledge comes the logical answer to the question of complete or partial removal of mucous membrane during the radical operation. Theoretically, all diseased mucous membrane should be removed and all normal or nearly normal mucous membrane left. In practice we choose to be radical if in doubt. Chronically diseased mucous membrane will likely remain diseased.

Operation.—The operation may be done under general or local anæsthesia. Our cases under local anæsthesia have been much freer from hæmorrhage. We put the adrenalin into the antrum through the wall before making the incision. The incision extends from the last molar to the frenulum. A grey colour of the bone in the canine fossa often denotes a purulent lining membrane, while a bluish tinge may indicate polypoid masses. The anterior wall is removed well up on both sides of the infra-orbital foramen, and a careful examination made of the contents and state of the mucous membrane, for we believe it is possible through the knowledge gained to choose between Denker's operation and the less radical procedure of Caldwell-Luc with flap. If the whole mucous membrane is purulent with polypoid, hæmorrhagic or atrophic areas the original incision is continued somewhat past the frenulum and the bone is removed through the incisive fossa and crista pyramidalis to the apertura pyramidalis and the antrum completely denuded of its mucous membrane.

If, on the other hand, we recognize considerable areas of normal or nearly normal mucous membrane, even though the remainder does seem purulent or atrophic, we decide on the Caldwell-Luc operation with nasal flap. The normal or nearly normal sections of mucous membrane are left and the polypoid areas are removed. We do not pretend that this macroscopic examination of the mucous membrane is altogether trustworthy, but our results lead us to believe it is sufficiently definite to be followed in choosing between these two types of operation. We try to be very careful to eliminate any ridge between the nasal and antral floor, and with a back-bent chisel to remove the nasal wall very well forward. We seek to turn down a good quadri-

lateral flap from the nasal wall. In this way quite satisfactory access for future treatment and lavage of the cavity is secured.

This method of determining just how radical we should be by the macroscopic examination of the mucous membrane after commencing the operation seems a rational one to us. It makes it possible to do with considerable less bone destruction, and yet by careful removal of the

nasal wall well forward and well down to get all the good results of Denker's procedure.

We remove the packing gradually, commencing on the second day after the operation. We rarely find it necessary to wash the cavity more than four or five times, but ask our patients to return for supervision.

The results of this procedure are almost invariably gratifying.

CLINICAL AND BIOCHEMICAL FINDINGS IN TWO CASES OF ACUTE DILATATION OF THE STOMACH*

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IN 1921 one of us (R.) reported a series of cases demonstrating the prognostic value of the chemical study of the blood in acute abdominal conditions.¹ The observations made were prompted by previous clinical observations of Tileston and Comfort² and those of Cooke, Rodenbaugh and Whipple on experimentally produced intestinal obstruction in animals.³ Intestinal obstruction was found to cause an increase of the non-coagulable nitrogen content of the blood. The intoxication observed was attributed, in great part, to a proteose which was apparently also found in the exudates of peritonitis and pancreatitis. That this proteose was not necessarily due to bacterial activity was suggested by the fact that it was also found in peritoneal exudates produced by the injection of sterile turpentine and in pancreatitis produced by the injection of sterile bile. The accumulation of the non-coagulable nitrogen in the blood was apparently not due to defective elimination, since the high values found were associated with good kidney function. Tissue destruction was, therefore, the explanation suggested.

In this report, 16 cases in all were recorded and were tabulated in order of their concentrations of blood urea. The striking feature in this tabulation was that all the deaths were grouped together at the top of the table. The kidney function in all of the cases was normal, as judged by the excretion of phenolsulphone-

phthalein. From this small number of cases studied it appeared unwise to form definite conclusions, but the following were suggested:

1. In intestinal obstruction, whether mechanical or adynamic, in acute general peritonitis and in acute pancreatitis, the blood urea nitrogen rises above the normal in spite of normal kidney function.

2. The rise of the blood urea is due to increased tissue destruction and not to defective kidney elimination.

3. The maintenance of a high blood urea nitrogen in the presence of good kidney function is indicative of an unfavourable progress, in spite of the amelioration of the clinical signs and symptoms.

Since this publication, a number of similar observations, with similar results, have been reported by others, without reference, however, to our report.

As the study of the blood chemistry in such cases has been a routine procedure in our hospital during the last ten years, a large amount of data has accumulated and interesting cases have at times been met with. Two examples might be cited. In one patient, although intestinal obstruction was suspected clinically, not only were the enemata effectual but x-ray examination failed to suggest obstruction. On the other hand, the blood urea was not only increased but continued to increase daily. On opening the abdomen, a Richter's hernia was found. In another case, following operation for duodenal ulcer, the blood urea continued to

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increase daily in the absence of clinical signs. Five days after the operation, a duodenal fistula was discovered. In our experience, it appears that in addition to the diseases referred to in our first report, any condition which causes necrosis of the intestinal mucosa, or interference with the mesenteric circulation, may lead to an increase of blood urea. The following two cases of acute dilatation of the stomach are reported, since, so far as we can ascertain, no biochemical observations have as yet been reported in such cases.

CASE 1

A male, (Hosp. No. 7070/29) aged 29 years, was admitted to the Montreal General Hospital on December 4th to the service of one of the writers (J. G. W. J.), complaining of pain in the palm of his left hand. On admission the only relevant physical finding was an area of unhealed skin about 3 cm. long by 1 cm. wide on the palm of his left hand at the site of an operation for a Dupuytren's contracture. (This operation had been performed on November 13, 1929). The remainder of the operative wound had healed and the fingers were fully extended.

On December 7, 1929, under ether anaesthesia, a flap of skin of the right hip was lifted and sutured to the affected area on the palm of the hand. On returning to the ward, he was postured so as to keep him lying on his right side. Owing to some pain over the operative area and general body discomfort because of the necessary posture, he was given morphine during the day.

The next day he complained of chilly sensations and general body ache, particularly in both legs. His temperature was 102° and, other than the fever, the physical findings were essentially negative. The condition appeared to be an ordinary "influenzal" infection and he was given aspirin-codeine compound. He slept very well that night.

The following day, (December 9th), the temperature had fallen, but not to the normal level, ranging between 99° and 101°. During that night he was frequently delirious for short periods. The next day, (December 10th), he felt much better. The temperature was only 99°. He was still taking the aspirin compound. In the early part of the evening, he became very restless, complained of pain in the lower part of the abdomen, and vomited for the first time. During the night, he was quite irrational, at times. At 6.30 a.m., the following day, (December 11th), he vomited about 1,000 c.c. of green-coloured fluid of watery consistency. The benzidine reaction for blood was positive. The physical findings were again negative, except for the fact that he was irrational. The abdomen was soft, there was no distension and the bowels moved freely with an enemata. The heart and lungs were normal and the operative wound was healthy. The next day, (December 12th), though he felt better in the morning, he again vomited during the day and became quite irrational. Again, the physical findings were negative. There was no distension of the abdomen and the enemata were effectual. There was an acetone odour to the breath, and on this account he was given glucose-saline solution intravenously. On December 13th, he was seen by one of our Internists, Dr. C. A. Peters. At that time, though he was much more toxic than before, nothing could be found on physical examination to account for the condition. That night, for the first time, he vomited about 500 c.c. of a dark brown fluid. The only additional finding was glycosuria discovered during the day and for this reason a blood sugar examination was made. There

was hyperglycæmia, namely, 0.196 per cent.* There was also a leucocytosis of 15,000.

On December 14th, all of the signs, vomiting, restlessness, delirium, etc., were exaggerated, and for the first time, the abdomen became prominent and hyperresonant. It was then obvious that he was suffering from acute dilatation of the stomach. Gastric lavage was ordered. It is to be noted that all of this time the patient was lying on his right side.

The following day, (December 15th), though the vomiting had ceased, he was obviously very ill and, for purposes of comfort, the results of the operation were sacrificed and the hand was separated from the thigh. During the afternoon, he began vomiting again and the blood findings were as follows:—

Urea nitrogen	73 mgm. per 100 c.c.
Creatinine	1.73 " "
Sugar	0.147 per cent

Glucose was given intravenously at four-hour intervals throughout the next twenty-four hours and, also, infundin ($\frac{1}{2}$ c.c. every four hours). The foot of the bed was raised. The next day, (December 16th), he was much more toxic and the blood findings were as follows:—

Urea nitrogen	84 mgm. per 100 c.c.
Creatinine	1.76 " "

The abdomen this day was soft and the outlines of the stomach were readily made out. He did not respond to gastric lavage treatment. It may here be noted that he vomited quite frequently and the bowels moved freely with an enema.

On December 17th, the physical findings were those of extreme toxæmia. He vomited at frequent intervals: there were symptoms of heart failure and he was given the usual stimulants. He died at 1.50 p.m.

An autopsy was performed and the only findings of interest are those in the gastrointestinal tract. Dr. L. J. Rhea, our pathologist, reported as follows:—

"The stomach is dilated. The duodenum is also dilated approximately to the diameter of an orange. There appears to be an obstruction at the third part of the duodenum where the bowel is crossed by a fold of mesentery containing the superior mesenteric vessels. The remainder of the intestinal tract below this point is contracted and contains no fluid or gas. By lifting the mesentery, with the vessels, the obstruction was partially released and part of the contents of the duodenum passed into the jejunum. The mucous surface of the stomach and duodenum shows congestion. Here and there small scattered hemorrhages are noted. The mucosa throughout the remainder of the intestinal tract shows no gross lesion."

No permission was obtained for examination of the brain.

CASE 2

A French-Canadian male (Hosp. No. 7179/29), aged 53, was admitted to the Montreal General Hospital, complaining of pain in the right side of the abdomen of five days' duration.

The personal and family histories were irrelevant

* Because of the intravenous injection of glucose neither the blood nor urinary sugar findings were regarded as important. The acetone odour to the breath was regarded as a starvation (vomiting) phenomenon.

He had always been in good health and, as he put it, "never had to lay off work for any illness," except following an accident nine weeks ago, when he had his foot fractured by a heavy weight.

He was well until December 2, 1929, when he developed pain in the epigastric region which continued for two days. There was no vomiting. The pain then became general over the whole abdomen and finally settled in the right lower quadrant. He was seen by one of us (J. G. W. J.) who detected a mass over the site of the pain. A diagnosis of "appendicitis with a walled-off abscess" was made and he was admitted to the hospital for operation. Shortly after his admission, he decided to leave and arrange some personal matters. In spite of our efforts, he refused to remain in the hospital on that day. He returned on December 11th.

On the second admission, with further history and examination, other possibilities as to diagnosis were considered, namely, (a) carcinoma of the caecum, (b) retroperitoneal tumour, (c) tumour of the right kidney, and (d) an inflammatory mass. The temperature was 99°; the pulse rate was 96. The results of the examinations of the urine and faeces were negative. The white blood cell count was 8,000. An x-ray was obtained following a barium enema. The roentgenologist's report states: "There was no evidence of any growth in sigmoid colon or caecum. There was no obstruction with loops, kinks or adhesions. There were no diverticula. There was a slight incompetency of the ileo-caecal valve."

On December 18th, he was operated upon under ether anaesthesia and a retro-caecal appendix was found with a walled-off abscess. The appendix was removed and the abdomen was closed. It is important here to note that no drainage tube was inserted, and that at the time of operation no other organs in the abdomen were manipulated. As there was no odour to the pus, the abscess was regarded as probably sterile.

A culture was taken in which the pathologist reported the presence of *B. coli*. His report on the appendix was "gangrenous appendicitis."

On December 19th, he had a troublesome cough and complained of pain over the wound. The physical findings were negative, except for the temperature, which ranged between 99° and 102° and a pulse rate between 94 and 92 per minute. He was made comfortable by being placed in a croup tent. The following day, (December 20th), there was some abdominal pain but the bowels moved freely. There was no distension and he voided freely.

On December 21st, there was still evidence of progressive improvement. The temperature ranged between 98° and 99° and the pulse rate was 80 per minute. The physical findings were entirely negative.

On December 22nd, there was further improvement during the day, but in the early part of the evening he complained of much flatulence and, again, examination of the abdomen was negative. The bowels moved freely with an enema. At midnight, he complained of much pain. The abdomen became distended and he vomited 500 c.c. of dark brown fluid. The diagnosis at that time was obvious, namely, acute dilatation of the stomach.

In view of the recent experience with the first case, a chemical examination of the blood was ordered and the findings were as follows:—

Urea nitrogen 69 mgm. per 100 c.c.
Creatinine 1.76 " "
Sugar 0.212 per cent

On this day, the temperature was normal. The pulse rate was, however, 98 per minute. The bowels, again, moved freely with an enema. He vomited during the day and was given a gastric lavage, glucose intravenously, and the foot of the bed was elevated. He was also given infundin. Vomiting, however, continued, and

there was apparently no improvement in the condition of the stomach.

The following day, (December 24th), there was marked displacement of the cardiac apex beat upwards. Enemata were, however, still effectual and the additional clinical signs this day were marked thirst and hicough. The blood findings were as follows:—

Urea nitrogen 76 mgm. per 100 c.c.
Creatinine 1.80 " "

On December 25th, there was exaggeration of all the signs and symptoms and the blood findings were as follows:—

Urea nitrogen 79 mgm. per 100 c.c.
Creatinine 1.80 " "
Sugar 0.166 per cent

The following day, (December 26th), there was definite improvement. A specimen of blood was obtained for examination at 8.30 a.m. and at that time, the patient had not vomited for the last sixteen hours. The blood findings were as follows:—

Urea nitrogen 57 mgm. per 100 c.c.
Creatinine 1.53 " "

Following this there was progressive recovery and there is nothing further to remark with regard to the clinical notes. The subsequent blood findings were as follows:—

December 27, 1929:

Urea nitrogen 59 mgm. per 100 c.c.
Creatinine 1.66 " "
Sugar 0.166 per cent

December 28, 1929:

Urea nitrogen 48 mgm. per 100 c.c.
Creatinine 1.81 " "
Sugar 0.117 per cent

December 30, 1929:

Urea nitrogen 36 mgm. per 100 c.c.
Creatinine 1.57 " "
Sugar 0.153 per cent

January 2, 1930:

Urea nitrogen 18 mgm. per 100 c.c.

January 4, 1930:

Urea nitrogen 18 mgm. per 100 c.c.

SUMMARY

The points of particular interest in the above cases are, therefore, as follows:—

1. In one case the cause of the dilatation of the stomach was definitely proved, by autopsy, to be mechanical obstruction.

2. In both cases, the blood urea nitrogen was increased and the increases paralleled the clinical pictures. The creatinine was practically normal, or, at least, the increases did not parallel the increases of urea, suggesting little impairment of kidney function.

3. As has been repeatedly found in our routine, in addition to causing increased urea in the blood, pancreatitis, peritonitis, "high up" intestinal obstruction, and necrosis of mucosa may also cause mild, though definite, hyperglycæmia.

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AGRANULOCYTOSIS

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IT has long been recognized that in certain cases those white cells of the blood which on staining show granules in their cytoplasm practically disappear from the blood-stream. During recent years much attention has been focussed on this type of case by numerous papers referring to *agranulocytic angina*,¹ *hypogranulocytosis*, *mucositis necroticans agranulocytica*,² *lymphatic reaction*,³ *agranulocytic symptom complex*,⁴ *sepsis with agranulocytopenia*,⁵ *agranulocytic infection*,⁶ *malignant leukopenia*⁷ and particularly one by Schultz, in 1922, reporting several cases of *agranulocytosis*.⁸

The following patients from the wards of the Children's Hospital fall into this group.

CASE 1

M. O., white, female child aged 1½ years, admitted to Children's Hospital March 10, 1928. (Patient of Dr. DeWitt H. Sherman).

Family and personal history.—Negative.

For a period of 3 months before admission frequent black and blue spots were noted on the child's skin. These came as a result of any slight trauma. Two days before admission a sty appeared on the left upper eyelid. On the following day the eye was much swollen and there was a sero-sanguineous discharge.

On admission the temperature was 100.5°. The child was pale and listless. The left eye-lids were edematous and there was a subconjunctival hæmorrhage on this side. On the legs and abdomen were a number of small purpuric spots. The remainder of the examination was negative.

Blood examination, March 10, 1928, showed red blood cells, 1,170,000; hæmoglobin, 19 per cent; white blood cells, 3,400; polymorphonuclears, 8 per cent; lymphocytes, 90 per cent; large mononuclears, 2 per cent; platelets, 56,000; fragility test, hæmolysis began at 0.4, complete at 0.32; Van den Berg, direct, negative, indirect, 0.3 units; clotting time, 4 min.; bleeding time, 15 min. +. Wassermann test, negative.

Progress.—The child was immediately given a transfusion of 300 c.c. of blood directly. The general condition promptly improved, the temperature dropped to normal and remained so, and 12 days later the child was discharged. At this time the blood findings were: red blood cells, 3,140,000; hæmoglobin, 62 per cent; white

blood cells, 5,200; polymorphonuclears, 2 per cent; lymphocytes, 98 per cent; platelets, 72,000.

One week later, however, it was noticed that blood was slowly oozing from several points on the tongue and buccal mucous membrane and from the right side of the nose. An ecchymosis appeared on the right cheek. The slight bleeding continued and after three days the child was again brought to the hospital. The skin contained many purpuric spots, and there were a number of small ulcerated bleeding areas in the mouth and pharynx. The temperature was 101.4° and there were signs of pneumonia at the base of the right lung. The blood count was: (March 29, 1928), red blood cells, 2,070,000; hæmoglobin, 32 per cent; white blood cells, 3,400; polymorphonuclears, 3 per cent; lymphocytes, 95 per cent; large mononuclears, 2 per cent. There were 2 nucleated red blood cells per 200 cells counted.

Transfusion was done, with some improvement. This was only temporary, however, for a low-grade fever persisted, the lesions in the mouth did not heal and new petechiæ appeared from time to time. There was no further hæmorrhage. Ten days later 300 c.c. of blood were again administered. There was no reaction. Two days later (April 12th) the temperature suddenly rose to 104.0°. Thereafter it did not drop below this level and death occurred on April 21st, six weeks after the first admission to the hospital. On the day of death the blood count was: white blood cells, 3,400; polymorphonuclears, 1 per cent; eosinophiles, 1 per cent; large mononuclears, 1 per cent; lymphocytes, 97 per cent; platelets, 34,000; clotting time, 9 min.; bleeding time, 15 min. +.

Autopsy report (Dr. B. Roman).—"There is moderate general icterus. The entire naso-pharynx is the seat of an extensive gangrenous inflammation of its mucosa, extending into the posterior nares on both sides, especially the left, and involving the membrane down to the bone. The mucosa is swollen, blackened and emits a fetid odour. The thyroid gland is atrophic and anæmic. Lungs: the base of the right lung is adherent with a very thin fibrinous hæmorrhagic exudate. There are multiple hæmorrhages of the lung, and pneumonia and pleurisy involving the base and posterior portion of the right lower lobe. The large bronchi are free from inflammatory changes. On section the involved part is gelatinous, bacon-like, and mottled with hæmorrhagic areas up to the size of a pea. All the lymph-nodes of the body are hæmorrhagic.

The heart is considerably enlarged; the left ventricle is dilated and pale, but shows no tiger-lily markings. There is a fresh hæmorrhagic fibrinous pericarditis.

The stomach contains tarry material and parts of the small intestine are filled with hæmorrhagic material. There is marked anæmia of the intestinal mucosa with no signs of any swelling of the lymphatic apparatus

in the intestinal tract. There are petechial hæmorrhages in the mucosa.

The spleen is quite small, and only a few follicles are visible on section. The liver is markedly icteric. The suprarenals are small and both are very poor in medulla. The kidneys are large, pale, friable, with distinct markings, and numerous hæmorrhages in the cortex. The bladder mucosa contains hæmorrhagic areas.

Microscopic and bacteriological findings.—Sections from the nasopharynx show almost complete necrosis of the mucosa, and deep invasion of the same with practically a pure culture of streptococci.

Bone-marrow.—(a) Vertebra: very marked atrophy of the marrow (almost fat marrow). Marrow cells are seen only in small numbers between the fat cells and occasionally in larger foci in the cavities. These consist mostly of small, lymphoid elements, a considerable number of normoblasts. Among these however, myelocytes, neutrophils and eosinophils, as well as myeloblasts are quite conspicuous. Leucocytes could not be made out with certainty; megakaryocytes are present but in very small numbers. (b) Shaft of femur near epiphysis: no atrophy is here apparent, on the contrary there are relatively very few fat cells to be found, and the marrow appears quite active, in places even hyperplastic. Here most of the cells are myelocytes, the rest are myeloblasts, small lymphoid elements, and normoblasts, and widely scattered megakaryocytes. Leucocytes are not to be found.

Small intestine.—Diffuse hæmorrhage of the mucosa and foci of hæmorrhage in the submucosa. Spleen: follicles well developed. In the pulp, a moderate amount of myeloid metaplasia is present, particularly erythropoiesis, but myeloblasts seem to be quite numerous in places and occasionally myelocytes. Besides there is a considerable amount of pigment everywhere in the pulp, free and enclosed in reticulo-endothelial cells. *Stomach.*—Same as small intestine. *Heart.*—Not remarkable. *Kidneys.*—Not remarkable. *Liver.*—High grade fatty change and periportal small cell infiltration. *Lung.*—Hæmorrhages in places, in others œdematous exudate in the alveoli mixed with blood and enclosing large macrophagic elements, partially or completely filling the vesicles.

Pathological diagnosis.—Gangrenous pharyngitis. Fibrinous pleurisy and sero-pericarditis. Pneumonia. High grade anæmia. Multiple hæmorrhages in the lung, lymph-nodes, gastro-intestinal and bladder mucosæ. General icterus. Partial atrophy of the bone marrow. Fatty change in the liver. Septicæmia.

CASE 2

R. G., white female child, aged 4 years, admitted to the Children's Hospital December 1, 1927. (Patient of Dr. Douglas P. Arnold).

Family and past history.—Negative.

Present illness.—On September 1st, the child developed a cough. One month later a doctor said she had pneumonia. After two weeks there was some improvement but the cough persisted. On November 1st, the abdomen began to enlarge and soon general œdema appeared. Two weeks later the child complained of cramp-like abdominal pains which recurred at frequent intervals until admission to the hospital on December 1st.

Physical examination (December 1st).—Large, deep ulcerations of the pharynx with greyish, white membrane. Signs of pleural effusion and pneumonia. Anasarca, ascites (?), enlarged liver.

Vincent's organisms in abundance were found in smears from the throat-lesions. Thoracentesis was done and 180 c.c. of opalescent fluid were removed. This contained 20 to 30 cells per cubic millimetre, practically all lymphocytes. The angina grew steadily worse and death occurred ten days after admission. The temperature varied between 100° and 101° with a terminal rise to 104°.

Blood.—(December 1, 1927): white blood cells, 7,600; polymorphonuclears, 58 per cent; lymphocytes, 42 per cent; hæmoglobin, 61 per cent. (December 10, 1927): white blood cells, 1,200; polymorphonuclears, 5 per cent; lymphocytes, 95 per cent; (2 per cent nucleated red blood cells); urea nitrogen, 16.8 per cent; chlorides, 429.

Unfortunately no autopsy could be obtained.

The majority (80 per cent) of the reported cases of agranulocytic angina have been in women of middle age, but the condition is not uncommon in men and a few cases in children^{9 to 12} have been recorded. The onset, which may occur after a more or less prolonged period of ill-health, is usually sudden, with high fever, general malaise, sore throat, and dysphagia. Icterus without obvious cause occurs in many of the patients. The pharynx is at first acutely inflamed. Soon a dirty gray membrane appears and on the third or fourth day ulcerations are noted. The lesions spread rapidly and areas may become gangrenous and slough. Similar necrosing processes may occur in the rhinopharynx, on the uvula, at the base of the tongue, around the teeth, occasionally about the genitalia, and, rarely, in the rectum. The presence of Vincent's organisms in smears from the lesions is noted in about 10 per cent of the case reports. No characteristic organism can be recovered, but bacteria of various sorts are found, often streptococcus. *B. pyocyaneus* has been reported in a surprising number of cases.

Death with a terminal pneumonia usually takes place within two to seven days, although the disease may last several weeks. Of about 150 cases in the literature, only 7 recoveries are noted. There are two reports of a second attack proving fatal.

The blood-count is the distinguishing feature of the disease. The white blood cells are reduced to a remarkably low figure (100 to 1500), and those of the granular series are almost absent. The lymphocytes, while relatively increased, are absolutely decreased in number, and Schmidheiny describes in them an excessive degree of cytoplasmic basophilia. In a large number of cases hæmoglobin, erythrocytes, platelets, bleeding and coagulation times, are within normal limits.

The more important pathological findings in cases which have come to autopsy are, in addition to the ulcerative lesions noted above, small hæmorrhages into the lymph-nodes, the gastro-intestinal and bladder mucosæ, pericardium,

pleura, lungs, etc.; diffuse broncho pneumonia with little inflammatory cellular reaction; the liver is sometimes enlarged and shows perivascular collections of lymphocytes; frequently bacterial emboli are found in various organs; bone-marrow often described as "red" but always with marked decrease in granular cells, sometimes fatty and aplastic. An increase of reticulo-endothelium is said by some to occur.

Such an unusual disease picture immediately suggests several questions: (1) Is this a disease *sui generis*? (2) Is it produced by a specific bacterium? (3) Is the lesion in the throat the primary one, and does toxin produced here cause secondary damage to the bone-marrow; or is the throat lesion secondary to a primary injury to the bone-marrow? (4) Does the disease occur as the result of an ordinary infection in individuals who are constitutionally predisposed to it? Unfortunately, at the present time none of these questions can be given an unequivocal answer; and yet as the number of reported cases continues to grow, and especially as the number of "atypical" cases increases, our conception of the condition takes on a more and more definite form.

The description above gives the "text-book picture" of agranulocytic angina, but if we read critically we find in the literature a long series of cases passing over imperceptibly to aplastic anæmia on the one hand and to infectious mononucleosis on the other. For example, many fit into the above picture except for the fact that blood-platelets are low with consequent purpuric manifestations. In others rapidly developing anæmia is the one feature not corresponding to the original description. A number of cases otherwise "typical" lack the necrotizing processes in the pharynx or other mucous membranes. In fact, ulcerations, fever, jaundice, enlargement of the spleen or liver, purpura, positive blood cultures, presence of specific bacteria, anæmia—all are variables. The one factor common to all of the cases, under whatever name reported, is decrease in the number of granulocytic cells in the blood.

Inasmuch as the blood picture is the most striking feature of this disease it may be well here to emphasize the fact that the old conception of the blood as a special form of connective tissue with a fluid matrix is erroneous; that it is really in the nature of a mixed secretion

from various organs, and that in examining the blood, therefore, we are investigating the function of these organs. The origin of the various cellular elements of the blood may be briefly reviewed.

Without entering into the discussion as to the ultimate parent-cell of the various types of circulating leukocytes we may say that in the normal individual granulocytes are formed *only* in the bone-marrow localized in certain parts of the skeleton. Lymphocytes are found in process of development in lymph nodes scattered throughout the body, and in foci of lymphoid tissue in many other organs. Thus, the marked decrease in the granulocytes of the blood in agranulocytic angina indicates severe injury to the bone-marrow, while the lesser but definite reduction in lymphocytes indicates injury to the lymphatic tissues of the body. With minor exceptions the sites of production of these two types of cells remain entirely separated. And so it is not difficult to conceive of a toxin which might injure the one apparatus while sparing the other. Furthermore, even within the bone-marrow it is quite possible for the erythropoietic element to escape injury, as it does in many cases, while the myelogenic cells are destroyed. A possible explanation is found in recent work on the pattern of the bone-marrow¹³ indicating that red blood cells develop from endothelium within the vessels in places of low oxygen tension, in *closed* sinusoids, while granulocytes develop from reticulum in *open* sinusoids where free circulation produces a relatively high oxygen tension. Thus a circulating toxin without any affinity for one special type of cell might cause marked damage to developing granulocytes, bathed as they are by free-flowing blood, before it even reached the young erythrocytes growing in collapsed vessels immediately adjoining. Under certain conditions other types of cells may escape injury in the face of extensive destruction of bone-marrow.

As an example of poisons which act on bone-marrow, and also to a lesser degree on the lymph-nodes, benzol may be cited. It tends to act selectively, injuring granulocytes to a greater extent than lymphocytes and to a much greater extent than erythrocytes. Yet with sufficient dosage all of these structures are destroyed. Furthermore, it is impossible to predict in a given case of benzol poisoning whether or not

the megalokaryocytes will be damaged, for in some cases with extreme leukopenia the platelet count remains normal, while in others with less severe leukopenia it is very low. Arsphenamine and its allied products occasionally cause a very similar type of bone-marrow damage,¹⁴ with leukopenia and extreme decrease in the cells of the myelocytic series. Erythropoiesis and platelet formation may or may not be disturbed. In 24 cases of arsphenamine poisoning collected from the literature¹⁵ granulocytic aplasia of the bone-marrow was invariably present, and it is significant that eleven patients showed severe stomatitis and sore throat. A number of the patients in the reports of agranulocytic angina had received arsenic therapy, and certainly some of these cases were due to arsenic poisoning.¹⁶ We are impressed immediately with the similarity in action of these poisons to that of a hypothetical toxin present in agranulocytic angina. Indeed, the blood pictures produced by the latter are no more variable than those due to such a standard poison as benzol.

It is apparent that the agranulocytic symptom complex may result from a variety of toxins, and whether or not anæmia and thrombopenia will be associated conditions will depend upon various factors, such as the amount of toxin and, as in the case of any drug, the individual susceptibility. All of the cases reported have occurred either following the injection of a poison¹⁷ or with a coincident acute infection to act as the source of a toxin. Often the infection is in the throat (agranulocytic angina) but often enough elsewhere. Wherever it may be, its spread is facilitated by the fact that the body's resistance is markedly lowered owing to the destruction of the granulocytic cells. A vicious circle is set up; the farther the local lesion spreads, the more toxin is produced, the greater the bone-marrow is damaged, and the less resistance is offered to the infection. It has been suggested that the throat ulcerations are secondary to a primary bone-marrow damage, as in leukæmia, typhoid fever, septicæmia, etc., and this is undoubtedly true in some cases, such as those following administration of arsphenamine. It is only to be expected when body resistance is lowered to the point of agranulocytosis that respiratory tract infections (pharyngitis and pneumonia) will run riot. On the other hand, when we consider the marked intoxication pro-

duced by toxin generated in the pharynx in certain cases of tonsillitis or diphtheria, it seems unnecessary in many other cases of granulocytic angina to look elsewhere than in the throat for a primary source of toxin. A fatal outcome is the rule when the infection is severe enough to produce agranulocytosis. When it is less severe, the patient recovers and the case will usually be given a less formidable diagnosis.

Other infections fundamentally differing, perhaps not very greatly, from agranulocytic angina are those in which there is only slight decrease in the granular cells and an actual increase in the mononuclear cells. In fact transitional cases are seen forming a series from completely aplastic anæmia on the one hand through agranulocytosis, purpura, "lymphatic reaction," and monocytic angina to infectious mononucleosis, in order of decreasing severity. It is well known that ordinary infections occasionally fail to call forth a polymorphonuclear leukocytosis, especially when they are overwhelming. Instead, a neutropenia and an absolute or relative lymphocytosis may be produced, as in a case of peritonitis with a leukocyte count of 900 per cubic millimetre of which 780 cells were lymphocytes (Piney);¹⁸ and one of kidney abscess with a leukocyte count of 600, with decreased neutrophils (Schwartz);¹¹ and one of stomatitis and membranous tonsillitis with a leukocyte count of 940, of which 0.28 per cent were polymorphonuclears (Turck).¹⁹ Or, an actual lymphocytosis may occur, as in a case of Ludwig's angina with 23,000 leukocytes, of which 96 per cent were lymphocytes (Sanders);²⁰ and a case of angina with a leukocyte count of 10,000, all lymphocytes (Prendergast).²¹ It seems quite possible that the same circulating toxin which produces an aplastic anæmia may in smaller doses, or in a less sensitive individual, actually stimulate the bone-marrow to produce the picture of infectious mononucleosis, which may be simply a milder form of agranulocytic angina. Still smaller doses may produce an ordinary leukocytosis. As a matter of fact, most of the common bone-marrow poisons cause in small doses a stimulation of the bone-marrow. Benzol in small doses produces a leukocytosis; tetrachlorethane causes a marked increase in the large mononuclear cells without change in the other elements; arsphenamine stimulates the large mononuclear-transitional group, while destroy-

ing the polymorphonuclear elements; the roentgen ray and radium are stimulating in small doses.

Constitutional predisposition of the bone-marrow to react to toxins with an agranulocytosis has been suggested as an explanation for these conditions.²² The fact that such a mild toxin-producer as *B. pyocyaneus* apparently has been the causative factor in a number of cases would lend support to this view. In the few patients who have been observed after recovery the blood has returned to normal.

There is no adequate explanation for the fact that so few cases of agranulocytic angina occur in children although severe anæmias are so common. The different distribution of erythroid and myeloid cells in the bone-marrow of adults and children may be a factor. Differential counts of bone-marrow cells indicate that in the adult 75 per cent are myeloid and 25 per cent erythroid, whereas in the infant the ratio is reversed.

SUMMARY

Two cases of infections producing agranulocytosis in children are reported. In both there were extensive ulcerative processes in the pharynx. Both patients developed anæmia, and one purpura. The bone-marrow of the child who came to autopsy showed evidence of widespread damage, particularly to granulocytes and megakaryocytes. Injury to the lymphatic apparatus also was evidenced by hæmorrhages in the lymph-nodes throughout the body and an absolute decrease in lymphocytes in the bloodstream. The causative agent in one case was a hæmolytic streptococcus, recovered in pure culture from the lesions in the rhinopharynx. In the other case a variety of organisms, including that of Vincent, were recovered.

A review of the cases reported in the literature indicates that agranulocytosis is the result

of the action on the bone-marrow of a variety of different poisons, such as benzol, arsphenamine, and the toxins of bacteria. Ulcerative infections of the mucous membranes are often but not invariably present. They may be primary, as in the cases reported here. In other cases they occur secondarily as a result of lowered body-resistance owing to primary damage to the bone-marrow by a toxin produced elsewhere. As might be expected, decrease in the granular cells in the blood is often accompanied by decrease in the other cellular elements as well. Agranulocytosis is apparently closely related to aplastic anæmia, purpura, monocytic angina, and possibly to infectious mononucleosis.

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SURGICAL TREATMENT OF HYPERINSULINISM.—Hyperinsulinism is a condition which may cause serious disability, and sometimes death. Frank N. Allan, William C. Boeck and E. Starr Judd assert that when the hypoglycæmic tendency is so strong that the patient is incapacitated, surgical treatment is justified. Resection of the pancreas appears to be a logical method of treatment. In one case reported by them in which hyper-

insulinism was due to tumour of the islands, operation was followed by relief from hypoglycæmic symptoms. In four cases in which organic change in the pancreas was not demonstrable, the results of partial pancreatectomy were not entirely satisfactory; yet the improvement observed in three cases was encouraging. Hope of control of the disorder by surgical measures, in such cases, may lie in more radical resection.—*J. Am. M. Ass.* **94**: 1116, Apr. 12, 1930.

CORONARY THROMBOSIS*

BY JOHN HEPBURN, M.D.,

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THE acute indigestion of yesterday is the coronary thrombosis of to-day. It is less than twenty years since this condition was first diagnosed clinically, and it is only in the past five years or so that it has become a subject of clinical teaching. Excellent papers by Herrick, Parkinson, Paul White, and Levine have appeared recently, and the subject has come to be of great interest because of the comparatively easy diagnosis, the importance of its recognition from a therapeutic standpoint, and because of its increasing incidence, which is probably more apparent than real.

ETIOLOGY

Coronary thrombosis is closely related to angina pectoris, which is always due to interference with the blood supply of the heart. The commonest cause of this diminished blood supply is coronary sclerosis. Coronary thrombosis always occurs in previously sclerosed coronary arteries, with the exception of the rare cases of coronary embolism resulting from bacterial endocarditis, so that the etiological factors are those of coronary sclerosis, namely, infection, hypertension, diabetes mellitus, etc. Syphilis and rheumatic heart disease play a very small rôle and hypertension is much the commonest pre-existing condition.

The age incidence is from 50 to 70 years but the condition occurs fairly commonly in the forties, and 8 per cent of the cases at the Toronto General Hospital were in the thirties.

PATHOLOGY

When a coronary artery is occluded by a thrombus or embolus the area of heart muscle supplied by that vessel becomes infarcted, softens, and either ruptures, usually from the fourth to fourteenth day, or heals by scar tissue formation. It takes from 5 to 8 weeks for a moderately firm scar to form.

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The vessel most often thrombosed is the anterior descending branch of the left coronary artery; much less frequently does thrombosis occur in the circumflex branch of the left coronary or in that part of the right coronary artery supplying the upper posterior part of the left ventricle.

Infarction practically always involves the left ventricle alone, but if the right ventricle is affected there is a more extensive infarction of the left ventricle present also. Whitten gives the following ingenious explanation of the escape of the right ventricle. "The branches of both right and left coronary arteries supplying the left ventricle dive into the muscle from the pericardial surface at right angles, and again turn at right angles to run under the endocardial surface. This tends to cause kinking and narrowing at the turns when the vessel becomes tortuous and elongated with sclerosis. On the other hand the branches of both vessels to the right ventricle follow the same general plane as the parent vessel and there are no rectangular turns."

Cardiac infarction may occur even when the artery is not entirely blocked. Marked narrowing of the lumen without thrombosis or embolism may result in infarction, and what we are actually diagnosing clinically is cardiac infarction, and not necessarily coronary thrombosis.

CLINICAL PICTURE

The patient is usually a man of 50 to 70 years, but may be much younger. He has often been subject to attacks of angina pectoris or has recently shown a diminished exercise tolerance, but may give no history whatsoever of cardiovascular disability.

The attack of coronary thrombosis, unlike angina pectoris, has no necessary relationship to exercise, and is characterized by severe pain, usually retrosternal but often epigastric. The pain is usually much more severe than that of angina pectoris, tends to be constricting in

type, and may or may not radiate like the anginal pain.

The patient often drops dead, but if death does not occur at the beginning of the attack we see the patient, in a severe case, usually in a state of collapse (hence the misnomer, "acute indigestion"), with a pale ashen colour, cold skin, and perspiring freely; the pulse is usually rapid and weak, the blood pressure low; there are râles at the lung bases or at times an acute œdema of the lungs; the heart sounds are very distant, especially the first, and occasionally a gallop rhythm or alternating pulse is present. The liver may enlarge rapidly in the course of a few hours.

The pain, unlike that of angina pectoris, lasts for several hours or longer, unless relieved by repeated large doses of morphine.

On the following day most cases show a slight fever up to 101° and a moderate leucocytosis of 10,000 to 12,000, both of which last for a few days. A pericardial rub is heard in a few cases and is usually transient.

During the few days subsequent to the attack one of several things may happen: sudden death from rupture of the heart, usually within 4 to 14 days; rapidly progressive heart failure ending quickly in death; slowly progressive heart failure; or the patient may improve markedly.

In atypical cases, the pain may be slight or even entirely absent, and may be replaced by sudden attacks of dyspnoea, not associated with effort, and accompanied or followed by pulmonary signs, varying from râles at the bases to acute œdema. Even when the pain is epigastric the differentiation from an acute abdominal condition is usually easy, as there is often a history of angina pectoris, and a sense of oppression in the chest, râles at the lung bases, muffled heart sounds with fetal or gallop rhythm, pulsus alternans, and more dyspnoea than is seen in an acute abdominal condition.

ELECTROCARDIOGRAPHIC FINDINGS

Normally, after the R wave, the tracing returns to the base line and runs along for a short distance before the T wave commences. In 1920, Pardee pointed out that shortly after an attack of coronary thrombosis the T wave begins on the downstroke of the R wave before it reaches the base line, and the R T interval be-

comes rounded, domed, convex, or sloping downwards. Later the T wave becomes sharply negative. The T waves in leads 1 and 3 act conversely, one becoming negative as the other becomes positive, and both usually have a sharp peak.

These in brief are the characteristic electrocardiographic changes, but following an attack of coronary thrombosis transient auricular fibrillation or flutter, or heart block, may occur.

PROGNOSIS

Because of the failure to recognize the condition it is impossible to estimate from vital statistics the proportion of cases dropping dead in their first attack, but the figure is probably above 10 per cent. Of those seen alive after the beginning of an attack, over 50 per cent succumb within six months from ruptured heart, heart failure, or subsequent attacks. A few, very few, patients recover sufficiently to resume their former activities. Parkinson has such a case, and in Toronto we have another, both alive and well, 11 and 9 years respectively, after a single attack of coronary thrombosis.

Most of those who survive the first few months have more or less marked cardiac disability, and many have typical angina pectoris for the remainder of their lives. So angina pectoris is a common precursor and a commoner sequel of coronary thrombosis. Parkinson sums up the prognosis succinctly by saying that a case seen alive has a 50-50 chance of surviving that attack.

TREATMENT

We have very little to offer the patient in the way of treatment, but that little is of the utmost importance.

1. *Relief of pain.*—Here nitrites are not only useless but may be positively dangerous, as they may cause an already low blood pressure to fall to a dangerous level. Morphine, gr. $\frac{1}{4}$, should be given and repeated every 15 to 30 minutes till the acute pain is controlled, and that may require several doses.

2. *Rest.*—We know from pathological studies that marked softening and liquefaction are part of the necrosis which results from infarction and that it takes about 8 weeks for a moderately firm scar to form. So the patient should be kept in bed for eight weeks after an attack,

and during that time he should be as inactive as possible.

Unless cardiac failure supervenes there is no need to alter the diet, except to reduce the quantity eaten. Stimulants, such as digitalis and caffeine, should be avoided, unless the blood pressure falls so low that not even a feeble circulation is being maintained. If such be the case strophanthin, gr. 1/100, or caffeine-sodium benzoate, gr. xv, given intravenously, may be tried. Later, if oedema develops the patient should be digitalized as in any other case of cardiac failure. If acute oedema of the lungs occurs, repeated doses of atropine, gr. 1/50, together with oxygen administration, greatly improve the pa-

tient's condition, especially if cyanosis is present.

Focal infection, especially round the teeth, should be cleaned up when the patient is able to leave bed, as the results in cases of angina pectoris, following adequate dental attention, are often amazingly good.

Perhaps the most important point in treatment is to keep the patient who has præcordial or epigastric pain in bed for a week, and to watch for the signs of coronary thrombosis; falling blood pressure, a pericardial rub, the appearance of heart failure, fever, leucocytosis, signs of embolism arising from a mural thrombus, and electrocardiographic signs.

SOME DERMATO-THERAPEUTIC NOTES*

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THESE notes are based on a lifetime devoted mainly to the study and treatment of skin diseases, and will, I hope, prove of use to the readers of this *Journal*.

ACNE VULGARIS

Recent visits to American clinics have demonstrated to me the tendency on this side of the Atlantic to depend largely on x-rays for the treatment of this disease. X-rays will remove the eruptions in many cases of acne, but in my experience a considerable number of such cures soon relapse. The application of more rays gives no better result. I have seen many sad cases of chronic x-ray dermatitis and epithelioma from the ray treatment of chronic and recurring skin affections. I am thankful to know that this has not resulted from my treatment, but it has led me to be perhaps unduly cautious. I have always looked upon x-ray treatment as a last resource, not as a routine method, for I have rarely had any difficulty in curing acne by other means.

Failure to cure acne in at least 90 per cent

of the cases is the result of not treating the scalp seborrhœa vigorously at the same time. Even in cases where the only manifestation of seborrhœa capitis is a slight dandruff, or else an abnormally oily scalp, active treatment is indicated. The scalp is the nursery and birthplace of the acne bacillus. Some dispute this, but personal experience has convinced me of its truth. Cases, which have resisted the most careful treatment of the acne spots got well, directly the scalp was treated. I have seen crops of comedones result from the use of scalp microbacillus vaccine in alopecia areata.

A case of acne requires consideration of: (1) general health conditions, especially those associated with adolescence and the alimentary canal; (2) scalp treatment; (3) the stage of the acne eruption, and its treatment. The latter two points are considered in this paper.

Scalp.—Remember that every dandruff scale is an infective particle, which must be removed. The safest method of removal is by soap and water washing, but some oily application must be made to the scalp directly after drying the scalp. An often disregarded function of the normal secretion of the skin is the protection

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against invasion of the rete by the bacterial flora of the horny layer. The minute oily layer on the surface prevents microscopic fissuring and separation of the squames, when the intrinsic muscles of the skin contract; this is especially the case with the countless erector muscles of the hair follicles of the scalp. Washing removes this natural oil, therefore a substitute must be applied. The oily matter may be applied as an ointment or as a spirituous emulsion of castor oil. To these drugs are added, sulphur, salicylic acid, tannic acid, benzoic acid, salts of mercury, oil of cade, all being examples of valuable drugs used in treatment. A favourite ointment in my practice is

R
Acidi benzoic., gr. 20
Acidi salicylic., gr. 10
Ol. coca nucis, dr. 2
Vaselini flav., dr. 6.

The hair must be parted at intervals of one and a half inches and a little of the ointment applied to the parting lines. A little practice with a narrow spatula, or a stiff gum brush, enables one to get the maximum of the ointment on the skin, not on the hair. It should be applied daily and immediately after washing the head.

The following is an example of a valuable oil emulsion.

R
Resorcin, gr. 25 to 30
Ol. ricini, fl. dr. 4
Ol. lavand., min. 6
Spts. vini (surgical), fl. oz. 2½
Aq. rosæ, ad fl. oz. 4.

Patients with white or blonde hair had better have 20 to 30 grs. of salicylic acid in the place of the resorcin. It must be sprayed all over the scalp daily and directly after washing the head. A spray apparatus with a long arm and a nozzle, which can be directed downwards, is the most convenient to use, *e.g.*, the DeVilbiss atomizer No. 15.

Careful directions must be given about washing the head. Despite criticism, I always direct the patient to wash the brushes and combs in soda water before washing the head. Otherwise the scurf-laden brush reinoculates the surface. Moreover, it is advisable to use a brush with soft bristles and a comb with a well rounded tooth. It is not necessary to use other

antiseptics than soda and water. I once had a very unhappy five minutes with a furious patient who had brought me a valuable hair brush with the bristles all coiled up like a loofah. This she said was the result of soaking in carbolic solution.

The lotion or the ointment must be applied immediately after drying the scalp. Patients with short hair should wash the scalp at least twice a week. As a rule, in the case of women with long hair one must be contented with weekly washing.

Much time may be saved when the scalp is thickly coated with scales, by a preliminary application of lamp paraffin. The process is not pleasant and may be objected to by many patients. Paraffin with a high flashing point is mixed with an equal quantity of water, and then poured over the scalp so as to thoroughly wet its entire surface. A towel is held across the brows during application and of course there must be no flame in the room; patients must not smoke until the oil is washed off. It should be allowed to soak for 15 minutes, or less if the scalp smarts. It is safer to avoid friction, lest an electric spark should fire the vapour. Several changes of hot soap and water are necessary to remove the paraffin. Many patients complain about this.

Oily seborrhœa of the scalp should be treated in much the same way, but in the early treatment of very oily scalps the following lotion may be used with advantage.

R
Acidi tannici, gr. 25 to 40
Resorcin, gr. 5
Spts. vini (surgical)
Spts. rosmarini
Aq. rosæ, aa fl. oz. 1.

All sorts of dietetic regulations have been laid down as part of the treatment of acne and seborrhœa, mostly useless. The patient must of course avoid overeating and drinking, food which upsets the stomach, and food containing much oxalates. The importance of the latter restriction is not generally appreciated. I may mention the case of a dermatological colleague who suffered from seborrhœa. In conversation with him over a case, he laughed at my fad in telling the patient to avoid altogether rhubarb, spinach, pineapple, and to only take moderate amounts of beans, cauliflower, and tea. Last

summer he told me he was converted to my opinion, as he had personally found that after eating rhubarb he had an exacerbation of his seborrhœic troubles. My attention was first directed to this many years ago. I was consulted about an epidemic of skin trouble in a large school for girls. The cases were so numerous that it was thought to be some infectious disease; the school infirmary was overflowing with cases. I found them to be all acute seborrhœic dermatitis. Of course, this is not uncommon among adolescent girls, but in this school it was beyond all normal proportions. I was a little puzzled to account for this but when I left the infirmary by the back door, I came upon one of the biggest plantations of rhubarb I had ever seen. Investigations about the diet demonstrated that the school authority had a theory that lots of rhubarb was good for health. The girls had rhubarb jam for breakfast and tea, rhubarb pies or stewed rhubarb for dinner and supper. Acne and seborrhœa were common in the school at all times. I advised a no-rhubarb diet, with almost immediate good results, and the great rhubarb plantation was scrapped. After clinical experience and observation, my opinion is amply confirmed. Always investigate what oxalic foods the patient is taking, and if much oxalate of lime is found in the urine, treat your patient for a time with small doses of hydrochloric acid with meals and magnesia between meals.

The treatment of acne varies with the stage and acuteness of the infection. If the skin is studded with blackheads, without much pustulation, a good scrubbing with pumice soap and hot water is a valuable preliminary. This may be repeated occasionally as required, the object being to file off the black head so that the succeeding lotion or powder may touch the spot.

R

Sulph. præcip., gr. 10 to 40
Calaminæ præp.,
Zinci oxidi. (sifted), gr. 90 (in proportions
to match the complexion)
Glycerini, min. 10
Aq. rosæ, ad fl. oz. 1.

or a powder—

R

Sulphur. præcip., gr. 30 to 60.
Calaminæ et zinci oxidi., aa, oz. 1.

The lotion or powder to be applied night and morning directly after bathing the part in hot water. These remedies should be applied freely so as to cover the skin with powder. After the morning application has become quite dry, for æsthetic purposes the conspicuous excess of the powder may be shaded off with dry cotton wool.

Some writers state that acne pustules must be treated on ordinary surgical principles, *i.e.*, by incision, evacuation of pus, and disinfection of the abscess cavity. In my experience the evacuation of pus and disinfection should be accomplished by suction methods. Bier's cups are invaluable for this. The suction should be intense enough to evacuate the pus and remove a little blood after it. If the blood comes through the walls of the abscess cavity it washes it out with an aseptic antiseptic fluid, without irritation and without scarring. If attempts are made to clean the cavity with extraneous antiseptics, some scarring will result, an important thing to avoid on the face. A tiny linear incision followed by suction leaves no visible scar. Small abscesses may be advantageously opened with a small acne lancet. This is practically painless, and so may be done by the patient or attendant, a valuable point when the patient lives at some distance. If the abscesses are left to rupture spontaneously some scarring inevitably results.

It is quite rare for abscesses to fill up again after incision and suction. Even if enough blood is not drawn through the cavity, a large number of leucocytes and serum are brought to the part and the pathogenic organisms thereby destroyed.

If the acne does not clear up in a few weeks, the process may be hurried by a change of application. Perchloride of mercury is useful for this purpose. Two days' use of boric lotion, to allow the sulphur to be removed, before starting the mercurial is advisable. The following formula by Darier is advised.

R

Hydrarg. perchlor.	0.2
Acidi aceticæ	1.0
Tinet. benzoin.	5.0
Kaolin.	5.0
Alcohol.	20.0
Aq.	70.0

I have found this useful for a change, but it must not be used long in severe cases. Sometimes when the skin gets very dry and scaly, and the patient complains of discomfort, an altera-

tion to a fatty base is advisable. Ointments in general should not be used in the early stages or in cases with tumid lesions. A favourite application, which patients like, is:

℞
 Resoreini, gr. 5
 Zinci oxidi,
 Amyli, aa gr. 30
 Ol. theobrom.
 Ol. oliv. q.s. ad 1 oz.
 Ol. rosæ geranii, min. 5.

Mix the above and add enough red Armenian bole to produce a flesh tint. Apply to the surface so as to leave a thin layer on it. Or an ointment, such as:

℞
 Sulph. præcip. gr. 5
 Boracis, gr. 30
 Vaselini flavi, oz. 1.

Reducing disfiguring scars, resulting from old standing cases of acne.

It sometimes happens that patients come to us with the above condition already existing. Treat such cases as above until the co-existing active acne is cured. Afterwards treat the old scarring. X-rays are useful in such cases, but before applying them be very sure that the patient has not been previously treated with rays. They must not be used while any reactionary redness exists from treatment. After their use, no irritant or stimulating application must be applied for six weeks. About four-fifths of a pastille dose, filtered through $\frac{1}{2}$ mm. aluminium, should be given in a single dose. Of course, the pastille is to be placed below the filter, i.e., between it and the skin.

Another way to improve the patient's appearance is by peeling off the epidermis with some strong reducing agent. A resorein paste similar to that originally recommended by Prof. P. G. Unna is valuable:

℞
 Resoreini, 20.0
 Zinci oxidi 24.0
 Terræ siliceæ 4.0
 Ol. amygdal. dule. 12.0
 Adip. benzoat. 60.0

Do not forget that resorein is incompatible with lanolin. It is of course a powerful remedy, and will be painful to most patients, causing

some discomfort. It is also disfiguring for a time and necessitates the patient stopping in for a week or two, especially in cold weather. In England, I postpone its use until summer. During its application it is advisable to test the urine daily for albumin, but I have not yet had a case in which albuminuria or other symptoms of resorein poisoning occurred. It is of course only to be applied to limited areas, e.g., the face. It should be smeared on in a thin layer daily, and kept constantly on, the face not to be washed during its use. In a day or two, the surface gets dark, the skin becomes a little tense, then in three or four days the upper part of the epidermis shrivels, so that a pair of forceps can be inserted under it by which it is peeled off, like a thin goldbeater's skin. Usually peeling starts in four to five days when of course, the application is stopped. Always warn the patient of the discomfort. If peeling does not result in four days, and there is no constitutional sign of resorein poisoning, the strength of the paste may be increased.

Vaccines of either acne bacillus or staphylococci, or mixtures, were formerly largely used in acne but now have to some extent gone out of favour. My experiences are as follows. Vaccines often cause temporary involution of the disease but it usually relapses after the vaccine is stopped. They not infrequently fail to do even temporary good. Occasionally, but fortunately rarely, they make the case worse. I have almost entirely given up their use.

ACNE ROSACEA

Rosacea, or as it is often termed acne rosacea, is another disease in which vigorous treatment of the scalp seborrhœa is necessary. In fact, many cases of rosacea will get well if the scalp only is treated. The face, however, should have attention. The milder applications must be used first. Lupus erythematosus sometimes develops into rosacea. It seems possible that over treatment may start or accelerate this most undesirable evolution, should the patient have somewhere a focus of streptococci. I always begin treatment of the face with a plain calamine lotion, adding later a sulphur content in gradually increasing amounts. Five grains of precipitated sulphur to the ounce is quite strong enough to start with. The internal use of capsules of ichthyol (4 gr.) two or three times a

day after food helps. If after all erythema and crusts have gone a few dilated capillaries remain they may be removed by electrolysis.

Rapid cure of long standing rosacea is generally obtained after curing the scalp seborrhoea. Now and again cases occur in which considerable perseverance is needed; but practically all get well eventually. Barber has pointed out that obstinate cases require hydrochloric acid with their food.

SENILE PRURITUS

A very large proportion of these troublesome cases are curable by simple, though little used, treatment. The following is quoted from a contribution I made to the *British Medical Journal* of August 24, 1925.

About twenty years ago I noted in a French medical journal a letter on the value of flesh brushing in pruritus senilis. I happened to know at the time of the matron of a large nursing home who had for several years suffered severely from an intense and intractable pruritus senilis. I suggested she should try this treatment; its success was perfect; it gave immediate relief, and after a few weeks she was able to stop the treatment for intervals of many weeks. She was able to continue her work for several years afterwards.

It was long before I had another case; but it was attended by similar success. Since then it has been my sheet anchor in the treatment of this trouble. I have had a few failures, but they form only a small fraction of all the cases. The following quotation from a letter of a retired medical man is typical of what patients think of the treatment:

"After years of suffering and elaborate treatments this simple method has completely cured my wife. The simplicity of the treatment and the perfect cure can only be compared with the dipping in the river Jordan."

The treatment is as follows:

A brush resembling an ordinary bath brush but with soft bristles (a little stiffer than the bristles of a baby's hair brush) is used. The whole skin is thoroughly brushed down with it in a warm room every night, and later also in the morning if necessary. A large quantity of a whitish powder is removed from the skin. This powder consist mainly of horny epithelium. If the somewhat thinned skin of an elderly person with general pruritus is examined with a lens small refractive areas are seen glistening over the surface. Some of these may be semi-detached as a scale, others with edges separating and tilted up; the majority are flat and almost adherent. Fibres of the underclothing entangle these scales and the sense of itching is excited. The flesh brush removes the scales and cures the patient.

I do not know of any text-book in which this treatment is described. I have personally described it to many colleagues, who report to me its successes, and am publishing this note in the hope that it will prove of equal value to others as it has been to me in the treatment of these distressing if not serious cases.

REMARKS ON ACUTE LEAD POISONING: ITS PREVENTION DIAGNOSIS AND TREATMENT*

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WITH the extremely rapid development of the storage battery business in the past decade, poisoning by lead has become a much more common occurrence than when it was known as "painters' colic." This paper is not a survey of lead poisoning in general, but refers to cases occurring in men engaged in the manufacture of batteries. During four years the men under supervision have had monthly inspections, including blood smears, blood pressure readings, examination of teeth and gums, reflexes, hand grips, conjunctivæ, scleræ, and the colour of the skin.

Many of the steps in the manufacture of a battery are not generally known, therefore, it may be advisable to sketch briefly the hazardous

parts of the process. (1) The mixing room where the red lead oxide and litharge are weighed in barrels or drums and dumped into a mixing machine. (2) The pasting room where the wet freshly mixed lead is, by machine or hand, pasted on the moulded plates. (3) The forming room where the dried pasted plates are given their first charge. (4) The splitting machine, by which the dry plates are split and buffed. (5) The burning bench where the plates are fused together into units. (6) The assembly line, where insulators are inserted between the plates, and the whole assembled into their cases, covers are put on, etc. No case of lead poisoning has yet been found in the moulding room or on the charging line.

With this very brief outline of the stages of the manufacture of a battery, it can be readily

* Read before the Wellesley Hospital Clinical Society, January 16, 1930.

appreciated that the principal hazard is the lead dust. The respiratory tract is the avenue through which the dust is absorbed. The amount of lead absorbed through the skin is not an important factor. Therefore, the biggest problem in the prevention of poisoning is to prevent workers from breathing lead dust. This is attempted in many ways; for example, by the free use of water on the floors, and where possible on the benches; adequate suction and draft, pipes and fans over, below, and around the most hazardous places, to remove dust; the enforced use of respirators, either air or moist gauze; the provision of locker rooms and shower baths, so that men do not have dried lead on their skin and street clothes; the maintenance of a lunch room apart from the factory proper.

Lead occurs in the body, chiefly in three forms. (1) The sulphide in the gums is the result of the action of hydrogen sulphide arising from decomposition in the mouth or by the action of sulphocyanide of potassium which is present in the saliva. (2) In the blood it occurs as a colloidal solution of lead diphosphate. (3) In the bones it is lead triphosphate. Very slight changes in the normal hydrogen-ion concentration of the blood, either towards the acid or alkaline side, will increase the lead in circulation, because this changes the lead triphosphate into the diphosphate.

Symptoms.—The most frequent are, abdominal cramps, constipation, "bad" or metallic taste in mouth, nausea or vomiting, and anorexia.

The cramps are not related to food and may come on at any time of the day. They are general in nature. Except in a well established case they do not seem to interfere with sleep. In fact, the patient often complains of being lethargic and drowsy, probably as a result of the anæmia and constipation which are also present. Sometimes there is a heavy feeling present in the epigastrium, which does not amount to definite pain. The constipation is extreme. At times a bowel movement is only obtained after repeated purgatives and enemata. The bad taste is described by the men as being metallic or sweetish in nature, and situated far back on the tongue and in the throat. They say it is this taste which produces the nausea and vomiting. The anorexia is mostly for breakfast, but this symptom is far from constant, especially in

the milder cases, as many men say their appetite is improved.

Signs.—The lead or "blue" line of gums; pallor or a jaundiced colour of the skin and mucous membranes; a heavy odour to the breath; a coated tongue; stippling degeneration of red blood cells; poorly staining and deformed red blood cells; the recovery of lead from the urine. No wrist or foot drop, or loss of reflexes has ever been noted. These probably occur in the more chronic cases.

The lead line is a very poor guide to diagnosis. It certainly proves exposure and absorption, but many cases have been known where it has been entirely absent, and, conversely, many men who have shown it for years have presented no symptom of poisoning. The colour of the skin is a better guide than the lead line, particularly if there has been an opportunity of knowing the man previously. The change in colour from a normal tint to a pallor or yellow strongly suggests an increasing anæmia, due to the breaking down of the red blood cells in the blood stream, and the production of an increase in the bilirubin content of the blood.

The odour of the breath is characteristic. It is "bad" from poor elimination, and also has a peculiar heavy sweetish character. However, it does not resemble the striking sickening smell of acetone in acidosis.

Stippling of the red blood cells is not an absolute guide to the severity or the diagnosis of the disease, but is of value when considered with other signs. In order to make a diagnosis of lead poisoning various writers¹ have stated that it is necessary to have at least 500 red blood cells per million showing basophilic degeneration. Other authors consider 100, 200 or 1,000 as necessary. In this work 500 has been optionally chosen, and at the same time great weight is given to other factors. For instance, many men will show more than this and be apparently well, without symptoms. Others will have many symptoms with fewer stipples. Several men who have been under close observation for four years have shown a count of about 500 for the whole time and yet have remained free from other signs or symptoms of lead poisoning except a blue line. Numerous blood pressure readings have been taken and found stationary at a normal level.

Malingering among lead workers is sometimes

a problem. These men know all the symptoms, therefore one has to rely on signs. As the signs are variable, certain tests may be carried out. Advantage is taken of the fact that calcium stores circulating lead in the bones, whereas potassium iodide brings it out from the bones into the circulation. True symptoms of acute lead poisoning depend on the amount in circulation. For example, if 30 grains of calcium lactate are given daily for a week, and the symptoms are unchanged, the man is probably malingering; whereas if his symptoms improve or disappear he should be classed as a probable case of lead poisoning. Or another test can be carried out, provided there is no albumin in the urine. If 15 grains of potassium iodide are given daily for a week, the true lead poisoning patient may have an exacerbation of symptoms and also an increase in stippled cells, provided there is lead in his bones to be mobilized. The malingerer will, however, have no increased symptoms. If the man still complains, the final test is made by ashing the twenty-four hours specimen of urine and estimating the lead excretion. Chapman² states that from one-quarter to one-half a milligram (.00025 to .0005 gm.) of lead per litre of urine is sufficient to cause plumbism.

In considering the differential diagnosis, one must always be very sure to distinguish between a false and true lead line. The presence of pyorrhœa, and black tartar plaques on the teeth below the gum margin will often mislead one as to the presence of a blue line. This error can be avoided by slipping the corner of a white paper between the tooth and gum margin and examining the gum with the aid of an auroscope lens and light. A true lead line will show the fine sulphide granules in the gum, one-thirty-second to one-sixteenth of an inch from the margin, while the false line will be obscured by the paper. In this connection cleaning the teeth regularly, and having any pyorrhœa properly taken care of by a dentist, is insisted upon, as it has been proved frequently that men who practice good oral hygiene seldom show a true line, while those who show oral sepsis develop a line after comparatively short exposure.

Those conditions from which acute lead poisoning must commonly be differentiated are: duodenal ulcer, gall bladder disease, in-

testinal influenza, appendicitis, and intestinal obstruction. A history of exposure is the biggest single factor which will aid in a diagnosis, but because a man's work exposes him to lead it does not follow that his abdominal pains are lead colic. These men have ordinary common abdominal conditions causing pain just as other people do, and one must always beware of overlooking acute appendicitis. In cases, however, where the symptom complex is atypical and does not give a clear cut picture of any of the commoner abdominal conditions, lead poisoning should be suspected. The following are the signs and symptoms of the commoner abdominal conditions, compared with those of lead poisoning.

Lead poisoning.—A history of exposure can always be obtained. Pains have no relation to food and are crampy in character. Nausea has no relation to pain. There may be nausea without pain. The abdomen is usually soft and non-resistant. Other writers³ however have described it as hard and retracted. Palpation does not increase the pain. The pain may be located anywhere in the abdomen, but most commonly radiates from the umbilicus, or is in the ileo-cæcal region. Gas is never a prominent feature. There is no fever, or leucocytosis, but there may be a mononucleosis. The pulse is slow, and may be hard and small.

Duodenal ulcer.—The history. The pain is relieved by food. There is a definite relation of nausea and vomiting to the pain. The location of the pain, circumscribed and high in abdomen.

Gall bladder disease.—The history. Gas is a prominent feature one-half to two hours after food. Tenderness over the ninth costal cartilage. Colic and jaundice. X-ray findings.

Obstruction.—The history. The patient is much more acutely ill. Vomiting is more persistent and characteristic. The abdomen may be bloated. The pulse is slow and full at first, with subnormal temperature; later, fast and thready, with fever.

Appendicitis.—The history. Pain located in the right iliac fossa. Tenderness with splinting of the abdominal muscles. Pulse accelerated, fever, leucocytosis.

Intestinal influenza.—The history. An acute febrile disease; temperature and pulse raised. The pain is much less severe. Vomiting not prominent.

TREATMENT

The acute symptoms of lead poisoning are caused by lead in the tissues and circulating blood. The first object, therefore, in treatment is to remove this lead from the circulation. This is done by storing it in the bones through the administration of calcium. The patient should be in hospital. He is put on a high calcium diet, consisting of fruits (other than bananas), green vegetables, carrots, turnips, milk and foods cooked with milk, eggs, cheese, and butter. He should take at least one quart of milk daily, or a quart of clear saturated lime water. He is given calcium lactate, ten grains thrice daily, or *Syr. Calcii Chloridi* (Powell & Co.), one drachm four times a day. If the symptoms are very severe or slow in responding, 15 c.c. of a 5 per cent solution of calcium chloride, administered slowly intravenously, will clear them most remarkably in many cases. Magnesium sulphate in 1 ounce doses, morning and evening, is the laxative of choice, and it may be necessary to resort to enemata. For the severe colic, atropine, gr. 1/50, given hypodermically, may be repeated once or twice, and is very effective. This treatment should be continued for one week, or until the symptoms have disappeared. The next stage in the treatment is the mobilizing of the stored lead from the bones, and causing it to be eliminated from the body, without producing acute symptoms. This is done by placing the patient on a low calcium diet consisting of meat, potatoes, corn meal, bread (prepared without milk) such as salt free nephritic, soda bicarbonate biscuits or crackers, rice (cooked without milk) canned tomatoes, canned corn, bananas, peeled apples, tea and coffee with sugar, but no milk. The drugs used may be chosen from the following. (1) Ammonium chloride, gr. 15 every hour for 10 doses daily. (2) Dilute phosphoric acid, 20 c.c. in a glass of water (sweetened if desired) every hour for 10 doses daily. (The mouth should be washed out with a solution of soda bicarbonate after each dose). (3) Potassium iodide, 5 grains thrice daily. None of these drugs should be used in

the presence of a nephritis, and care must be taken to avoid symptoms of acidosis, such as loss of appetite, headache, malaise. If these symptoms occur the dosage should be promptly reduced. (4) Soda bicarbonate, 30 to 60 grains every hour for 10 doses daily, is the drug of choice if albumin is present in the urine. Symptoms of alkalosis may follow its use, and hypersensitivity or tetany must be carefully watched for, and, if found, the dosage reduced.

This de-leading treatment may be continued for one week. Then the patient is put on an ordinary diet with no drugs for one week, and de-leaded again the next week. During the de-leading treatment the amount of lead being excreted may be checked by having the urine ashed. Two weeks of de-leading are ordinarily sufficient, but one can be guided by the amount appearing in the urine. If this is large in amount at the end of the second week's treatment, and there is no contra-indication, a third week's treatment may be given. When no more lead is being excreted, the calcium balance is again restored. After being treated the patient should be strongly advised against returning to the further hazard of lead absorption for, in spite of the rigid enforcement of preventive measures, it is impossible to entirely prevent some absorption of lead, and after lead is once absorbed, it can never be entirely eliminated.

This conception of lead poisoning has been gained over a period of four years' continuous supervision of one hundred men who have been exposed to the hazard of absorption of lead, and the treatment outlined above has been found to give the most satisfactory results.

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ELECTRO-DESSICATION VERSUS RADIOTHERAPY IN THE TREATMENT OF THE BASAL-CELL EPITHELIOMA OF THE SKIN*

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WE wish to report on the results which we have obtained by electro-dessication and x-rays in the treatment of cutaneous basal-cell cancers.

An enthusiastic radiotherapist is often inclined to think that roentgentherapy is the most appropriate treatment for malignancy, whilst an electrologist, also very much in earnest, maintains that electro-dessication is the only proper method. These contradictory opinions embarrass the practitioner.

For nearly three years, in our private practice as well as at the Dermatological Clinic of the Nôtre Dame Hospital, Montreal, we have treated numerous cases of epithelioma by either one or the other method. The following is the result of our observations. Our intention is to limit ourselves to the treatment of basal-cell growth of the skin.

As classically admitted, basal-cell epithelioma is a malignant new formation, but only of local importance. The glands are never involved, nor is there any metastasis. Its evolution is exceedingly slow and it takes years to develop. Left alone, it extends to the periphery, spreads to the deep tissues, and mutilates considerably, destroying the nose, ears, cartilages, eyes, etc.

Histologically, one sees malignant agglomerations whose cells are all of basal type. In no place is found the least tendency to cornification, as in a prickle-cell or in normal epidermis.

Clinically, this variety of epithelioma can present itself under any one of the following types:—

1. The flat cicatricial epithelioma. This extends irregularly whilst its centre forms a depression and becomes cicatricial. After a variable length of time it is an irregular lesion, cicatricial in some parts, ulcerous in others, presenting a border of small pearly granules.

2. The pagetoid epithelioma. Less frequent,

this is a superficial lesion, resembling eczema, well limited by plain edges and a filiform margin, where one often notices some very small granulations. Its surface is red, crusty, atrophic.

3. The rodent ulcer. This is a well limited hollow ulceration, somewhat indurated. No granulation is found along its border. It has a marked tendency to spread towards the deep tissues.

4. The proliferative epithelioma. Rather uncommon, this is a tumour whose dimensions vary considerably (from a pea to a chestnut). It is a bloody and crusty macaroon.

5. The epithelioma terebrans, the development of one of the preceding varieties, is an irregular, sinuous ulceration, which presents a red, crusty and oozing surface. It will offer a more or less appalling aspect according to its localization and extent. However, the general condition of the patient is generally good (as the glands are not involved and as there is no metastasis.) If untreated the patient will die of an hæmorrhage, by a rupture of a large blood vessel, of meningitis, or of erysipelas, etc.

Nevertheless the baso-cellular epithelioma does not always present itself to the clinician under such characteristic aspects. The appearance of the tumour often precludes an accurate clinical diagnosis, being more or less doubtful. Histological examination of each lesion is necessary. Biopsy, systematically done, negatives or confirms the clinical observation. It gives a definite and immediate answer, ending all discussion.

On account of its unquestionable superiority we have adopted the method recommended by Fordyce, MacKee, Belot—curettage of the lesion, followed immediately by one massive treatment (two or three skin units) of moderately penetrating rays.

Our factors are: 100 kilovolts; 2 milliampères; 8 inches skin-target distance; no filtration; a Coolidge tube; 3 minutes—skin unit.

After a local anæsthesia with ethyl chloride we scoop out crusts, pearly granulations, necrotic

* Read at the sixtieth annual meeting of the Canadian Medical Association in June, 1929; appears simultaneously in *L'Union Médicale*.

tissues, in the depth and on the edges. Hæmorrhage is controlled by a compression of a few minutes. Irradiation is then immediately applied.

With Clarke, Wyeth, Eller, etc., we understand by electro-dessication the therapeutic use of the monopolar current of Oudin. The current is regulated before applying it. One should not try to get a noisy spark, for the latter only indicates a more or less high tension, according to the length of the spark. The points of the spark rods are brought near together to obtain a noiseless spark. With the auto-transformer the intensity is regulated. As it is the intensity which produces the necessary heat for a proper electro-dessication it should be fairly strong. The electrode must be held near the lesion so that the current may immediately go through without any sparking. The tissue whitens, bubbles up and is illuminated. The same application is started again at the periphery of the previously destroyed tissue.

Among the cases which we have treated we eliminate those for which no biopsy was made, although many presented clinical signs of a characteristic baso-cellular growth. We also eliminate those which we were unable to follow up, and we do not consider these cases whose treatment does not go so far back as six months.

The remaining 53 patients are considered in the present report.

Some of these epitheliomata were recent, others were of a much longer period. One dated as far back as fifteen years; another had started six months previously. The majority had from one year and a half of evolution.

Their dimensions varied between the size of a pea to a lesion four inches in diameter. All those we have observed were located on the head,

the majority at the upper two-thirds of the face. The most frequent type was the flat cicatricial.

We treated 21 cases with x-rays and 32 cases with electro-dessication, with about the same results. As shown in our tables the proportion of cures, relapses, and failures is nearly the same.

The operative shock by either method is insignificant. Cicatrization takes about the same length of time, from 3 to 6 weeks according to the size of the lesion.

The cosmetic results are nearly similar, a white soft scar, not retracting. However, in certain patients treated by x-rays the scar is more noticeable on account of the telangiectasias which sometimes appeared afterwards.

TABLE I
RESULTS ACCORDING TO CLINICAL TYPE

	Treated by X-R.	Cured	Treated by E.-D.	Cured	Total
Flat cicatricial ..	14	14	23	23	37
Pagetoid	4	4	5	5	9
Ulcer rodens	1	0	2	0	3
Proliferative ...	2	1	2	1	4
Terebrans	0	0	0	0	0
	21	19	32	29	53

TABLE II
COMPARISON OF RESULTS

	No. of Cases	Relapses	Cured	Failures
X-R.	21	3	19	2
		14%	91%	9%
E.-D.	32	3	29	3
		9%	91%	9%

CONCLUSIONS

No marked difference was noted in the proportion of cures, failures, relapses, and as regards post-operative processes and results in 53 cases of basal-cell epithelioma treated by electro-dessication or by x-rays with curettage.

A DANGEROUS PREPARATION OF DIGITALIS. — John Wyckoff and Harry Gold give a brief summary of observations on the potency of digitalis. They found that of two specimens, one was twice as potent as the other. They stress the importance of knowing the exact potency of digitalis and, incidentally, they call attention to the misbranding of digitalis by manufacturers. It is not possible to state how frequently digitalis on the market is misbranded. The fact that such practice has been dis-

covered is a matter of grave concern to the physician who is compelled to rely on the accuracy of the manufacturing pharmacist. It is well to be reminded that digitalis is a potent drug which varies widely in activity, and the experience of the pneumonia committee in the forthcoming reports will indicate even more clearly the dangers arising from the use of any preparation of digitalis the potency of which is not accurately stated. — *J. Am. M. Ass.* 94: 627, March 1930.

A COMPREHENSIVE STATE SICKNESS INSURANCE ACT*

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ON first glancing at the above subject one makes unconsciously the two oft repeated remarks that "something should be done," "a law should be passed." This is usually as far as we get, and with these platitudes the matter is dropped. Granting that state sickness insurance offers the most efficient method of dealing with accidents and sickness generally, and with the acknowledged success of the Workmen's Compensation Acts in mind, we do very wrong to set aside so summarily the possibilities inherent in a state sickness plan.

In Canada, we are considerably behind the great, and even some of the smaller, powers of Europe in social and public health legislation, and since we sometimes think we are superior to certain of "those people in Europe," we should take shame and be stimulated to action by the knowledge that in such vital concerns we are actually far behind even such unfortunate countries as Poland and Bulgaria. So much for the first platitude.

We come now to our second platitude, that a law should be passed. Who, it may be asked is to pass this law? According to the Deputy Minister of Justice, speaking before a Federal Committee called to inquire into the matter, "Insurance generally is not mentioned in any of the enumerated subjects of jurisdiction conferred upon the Dominion Parliament by the British North America Act," but that it does fall within the subject of property and civil rights, which is conceded to the provincial legislatures by that Act. The Deputy Minister further stated, when questioned, that he thought "the Dominion would be free to contribute towards unemployment, sickness, and invalidity insurance, if it thought fit, although the matter had never been tested in the courts." This is no doubt the actual crux of the situation and the main cause of legislative inertia. Our federal parliament is apparently not directly concerned in the matter, and for

the present we must look to the various provincial parliaments for action, who have already a public health machinery fully developed. In a way, this is to be deplored, for one fancies that people are more willing to be led by Ottawa than they are by the more familiar politicians of the local houses. Nevertheless, the federal government has taken steps to investigate sickness insurance, a commission has been appointed, and its findings may be had for the asking. These findings are more particularly of interest where they refer to the measures which now obtain in foreign countries. Although this part of the report is necessarily brief, yet as it stands it shows what great strides have been made by many foreign lands, and incidentally, where we might improve upon this work when we come, as the writer hopes we shall, to formulate our own laws on sickness insurance. Let us discuss a few of the points briefly.

The first item worthy of note is that, to the writer's knowledge, none of the countries have a truly comprehensive law. Their legislation has a tendency to protect certain definite classes of people, that is to say, the worker, farmer, sailor, or servant, otherwise, the wage earner with a pay envelope. Professional people, men of means, or tradesmen do not participate; the great unwashed pay in to no sickness benefit and must depend on free clinics for medical attention. This is not as it should be. Every man, woman and child ought to have sickness and accident insurance premiums paid on him. It is obvious that an individual may be very wealthy one week and sadly in need of medical or sanatorium treatment the next, yet have no ready money to pay for such treatment, becoming thereby a charge on some doctor for his fees, or a menace to the public health by remaining out of hospital. Those persons who have no factory jobs, (using the word factory in place of favoured industry) need more than all others the benefits of early medical and hospital service. These are the

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women in garment-makers sweatshops, the junkman, the tout, the impoverished widow, the thousands of poor, and sometimes criminal, individuals upon whom the rest of our civilization walks. No doubt some, probably many, from this class would pay their sickness insurance premiums, but the premiums of those who did not pay would have to be divided amongst those who did. Very likely a great part of those who now attend free clinics, though able to pay, would, in the event of a comprehensive sickness insurance law, be routed out and forced to pay for their medical service, as they are apparently willing to pay for fur coats and other luxuries.

There remains to be mentioned the other heterogeneous class, including the petty merchant, contractor or agent, the many struggling teachers, business men, and professional folk. To this class, more than all others, would a comprehensive sickness insurance scheme prove a godsend. It will thus be seen that when, in Canada, we come to inaugurate sickness and accident insurance laws they must embrace every citizen, no matter what his class or employment.

Certain foreign sickness laws make provision that venereal diseases and accidents due to sports shall not come under the aid of the state. This is unwise as there is nothing so dangerous to the state as the spread of venereal disease, and few things so wholesome for the nations at large as manly sports. Therefore, the social diseases and the accidents arising from sports should deserve first consideration rather than be expressly omitted from any state benefit.

With regard to the English panel system by which certain physicians obtain the work arising from the state sickness plan. The author believes this scheme to be manifestly unfair, if only to the recent graduate, inasmuch as only some physicians benefit at the expense of others, who were, however, thought sufficiently competent to be allowed to practice. No matter what is done, we must not restrict the people's right to choose their own doctors. To do that is to tamper with the very elements of individualism and initiative. There is sufficient inequality in medicine to-day, let us by no means seek to increase it.

The main features of the sickness insurance

legislation which the author believes to be necessary are as follows:

1. Every self-supporting individual must pay premiums for himself and for each of his dependents. These premiums must be of such a size that, taken together, they will cover the cost of administering the scheme, the cost of drugs and appliances, the cost of hospitalization, and of burial when necessary, the cost of paying a living wage to a family where the provider is totally disabled, and, finally, an amount equal to two-thirds of the doctors' fees for the whole medical area, probably a province.

2. Premiums should be collected monthly and exchanged for receipts to carry or if necessary tacked on the door. Wilful evading of payment should be made a serious offence, punishable by a rising scale of fines and if necessary by a jail sentence.

3. Certain premiums would be more easily obtained by deducting them from pay envelopes and others by agreement might, in the country, be worked out on the roads.

4. Where it is found impracticable to collect from the wage earner, or to the extent it is known to be impracticable, the premiums will have to be obtained from his employers, if his wages are insufficient and the firm large enough to be good for it, or from the wealthier subscribers by enlarging their monthly contributions with due regard to their incomes or the luxuries which they seem able to afford.

5. An individual becoming ill or sustaining an accident when not at work, should be free to go to any registered physician and must pay him one-third of his fee. If a wage earner cannot pay a third of the doctors' fees he is presumably laid up, and the fund becomes liable for both fees and wages; otherwise the man is in need of social service or employment agency help.

6. A doctor being called to a case must make initially a complete examination of the patient and jot down his findings and history on a concise form supplied for the purpose by, and returnable to, the local guardians of the fund. In a great many instances this will call for the examination of the urine, a simple blood count, perhaps even a Wassermann test or a series of x-ray plates. The cost of obtaining such medical data might well be borne by the fund and the patient in the two to one ratio mentioned before.

7. Comparing what one hopes for against what one has in the Workman's Compensation Acts, it would prove helpful to the medical fraternity if their accounts with the fund were settled monthly instead of at the completion of the case, which might be long deferred.

8. Every practising physician being eligible to work under the scheme, only those who grossly abused the confidence of the patients and of the guardians of the fund would at any time be found outside the pale. It would be advantageous if regular post-graduate courses, coupled with some form of practical examination, were available and required for all practising physicians.

9. The control of any comprehensive sickness insurance act would have to be vested in the directors of public health for the various provinces, and could act perhaps to the best advantage through local non-political advisory boards composed of citizens prominent in each community. Care must be taken in choosing such boards that creed and race, money and medicine are all equitably represented. These citizens are the local guardians of the fund. Necessary office staffs would be employed by the various departments of health.

It is not the purpose, as it is certainly past the ability, of the writer to attempt to outline such an act in any but a very vague way.

The outstanding objections which one foresees will be made to a comprehensive sickness and accident insurance act such as is here suggested are outlined below:

1. It will first be said that many doctors are not to be trusted to play their parts honestly in a nation-wide scheme. This is quite true. It is also true that a still larger percentage of lay people would prove dishonest. That should not however be a drawback, as we are working among just such dishonest people and doctors to-day as we shall be to-morrow and the day after. As things stand at present, the careful and honest labourer or middle class person is being forced to pay for the polite defaulter of all classes. While many wealthy people pay out and even subscribe great sums for medical and hospital service for themselves and for the poor, there are very many also among the well-to-do who quite brazenly cheat their physician. So too, as it requires almost an hour, there are very few complete physical examinations made

in consulting offices to-day. Were he to do this, a doctor would find it difficult to see a sufficient number of patients in a working day to pay his expenses. It is not difficult to see that where the state steps in with laws, with forms, with penalties, and with supervision, the physician is going to improve the examination and treatment of his patients, as well we hope, as have fuller opportunities for post-graduate work. It would soon be quite noticeable and easy to check if some few doctors were unfit to do their part honestly.

2. It will next be pointed out how many people would become malingerers, either wholly or in part. Without a doubt this is a very real objection and one that will cause an endless waste of money and time. For malingerers there will be, loads of them. The easiest way to eliminate the hypochondriacal petty malingerer would be to increase the amount of his or her premium, where that is possible, or to instruct the doctor to increase the size of his fee while paying him less from the fund.

When one gets past the petty malingerer, one has to deal with the out-and-out fakir. There are two steps in dealing with him. The first is to put him to bed in a sanatorium whilst the case is being thoroughly investigated. The next step is to keep him in bed or give him so many hours work a day on the premises, whichever course seems wisest in view of the "complaints." If this fails to cure the malingerer he must then be suffering from impaired health, either physically or mentally, and an institution is the place for him. It will not be as easy as it sounds, because of the economic factor, and many of the cases will repeat and repeat.

3. The stupendous cost of any comprehensive state sickness insurance plan will render it prohibitive in the eyes of many. But the claim of the writer is this, that if we as a people cannot afford adequately to care for our sick, the sooner we know it the better. Having discussed briefly the outstanding drawbacks of a comprehensive law for sickness insurance, let us still more briefly, enumerate the benefits which it will give to the country as a whole. They will be: (1) the removal of the financial dread of illness; (2) the early diagnosis and adequate treatment of the majority of ailments; (3) the greatly increased equality or fairness of distri-

bution of the cost of sickness; (4) the general improvement in community health resulting therefrom; (5) the statistical data so obtained, of use not only to the medical fraternity and through it to the people, but the particular and immediate value in demonstrating to all the crying need of better housing and stricter public health regulations, particularly in certain cities and districts; (6) the immediate shattering of the public's complaisant ostrich-like attitude in being willing to do without an adequate number of hospital, mental asylum and sanatorium beds. Good roads and reasonable liquor laws are important, but a sufficient number of beds for the sick is far, far more important.

The benefits which would accrue to the medical profession from such a law are at least sufficient to make all doctors wish to propagate a demand for comprehensive state sickness insurance legislation among the people of Canada. The knowledge that every time he is called on a case, he is sure to receive at least two-thirds of his fee at the end of the month, that eventu-

ally he will be able to secure a hospital bed for every patient who requires it, whether for treatment or diagnosis; that he may hope to be relieved, and be able to attend post-graduate lectures and outstanding conventions every few years; that a certain monthly premium entitles him or any of his dependents to prolonged hospitalization if necessary; all these things should, so it seems to the author, urge any physician to propagate the simple idea of equalizing the cost of sickness by dividing it among the number of people in the country.

The writer feels that the medical fraternity should consider this problem from every angle, and that without delay, should come to a decision as to just what they want, and having done so, should undertake an intensive and prolonged campaign in order to educate the public so that they will demand of their legislators a truly comprehensive state sickness insurance act.

The ideas expressed in this article have no connection with the policy or plans of the Department of Pensions and National Health, so far as the author is aware.

RED NOSE.—This distressing stigma, which is hardly mitigated by calling it erythema nasalis, has many origins. Dr. J. C. Warbrick enumerates 13 causes which could be more conveniently classified as (1) local or intranasal, (2) reflex, as in rosacea, and (3) metabolic, as in renal and cardiac cases.

Any intranasal abnormality, whether mechanical or infective, or both, can give rise to passive congestion which in a terminal and exposed structure such as the nose will soon cause manifest and disturbing symptoms. The patient should be questioned about signs of nasal obstruction and referred to a rhinologist if there is evidence of such common conditions as a deflected nasal septum, chronic nasal catarrh, mucous polypi, or furunculosis in the atrium nasi.

Reflex causes are probably the most common of all those responsible for the red nose. A history of dyspepsia—associated, according to some authorities, with pronounced hypochlorhydria—and of concomitant facial flushing, can often be elicited and may explain the condition at once. There is no doubt that disorders of the uterus and adnexa are sometimes at the bottom of the symptom. Alcoholic excess, again, is an undoubted cause of erythema nasalis, but its existence is seldom admitted by the patient—probably because people whose red nose is a result of alcoholism do not usually bother to ask a doctor about it. Dilated veins are most apt to recur in this "reflex" group.

In the metabolic category we should have to consider such factors as the "chilblain circulation." In

these cases the patients are mostly young girls with bluish rather than red noses. Cardiac and renal back-pressure may play a part in causation, but such cases are not likely to present themselves for the disfigurement alone. Dyspepsia due to a gouty diathesis or hepatic dysfunction—not necessarily causing hypochlorhydria—may explain why an apparently normal gastric content is sometimes revealed on analysis. Constipation, doubtless, acts in a similar way, and it always needs attention when present.

A recurrent cutaneous infection, such as a low-grade erysipelas, although difficult to imagine in a form localised to the nose, is mentioned by Warbrick. There is also the possibility of localised infection of the sebaceous glands, with or without acne, and that exceedingly rare affection of the adolescent youth known as hyperidrosis rubra nasi. Adenoma sebaceum, first classified by Pringle, and sometimes associated with a deficient mental development, is in the nature of a nevus and confined to girls.

These are the main causes of a red nose, although the list is by no means exhausted. The symptoms may be part of a seborrhoeic tendency, with erythema and greasiness of the nasolabial sulcus and a scurfy scalp. It can also occur as part of the clinical picture in lupus erythematosus, psoriasis, and lupus vulgaris. It follows that all who aspire to success in treatment must possess a fairly extensive knowledge in the domain of general medicine, as well as the special experience that can only be acquired in the out-patient department of a dermatological clinic.—*The Lancet* 1: 1107, 1930.

Case Reports

A CASE OF ACUTE TUBERCULOUS ADENITIS

By F. H. PRATTEN, M.B., F.A.C.P., AND
L. C. FALLIS, M.B.,

*Queen Alexandra Sanatorium,
London, Ont.*

Mr. P., aged 24 years, was admitted to the Queen Alexandra Sanatorium on November 14, 1929.

The onset of the present illness.—He had had no complaints until early in July, when he noticed a soreness and tenderness on pressure over the lower end of the sternum. At this time his friends drew his attention to his sallow appearance. About the end of July he began work for the Customs Department, and after a few days realized that he was sick. He felt feverish and complained of weakness, and a swelling and soreness of the mouth, tongue and throat. He said that his mouth was ulcerated, so that it was difficult for him to eat. In spite of these complaints persisting, he continued to work till August 17th when he felt he could carry on no longer, and a few days later was admitted to a general hospital. The mouth condition gradually subsided but he had constant fever. There were no further developments until the appearance of a very irritable and hacking cough, pains in the left shoulder, and a swelling of the glands on the right side of the neck, all of which came on within a few days, about September 15th. About this time also he had two or three nose-bleeds. The cough persisting, his chest was investigated, including x-ray examination, and sanatorium treatment was recommended. He was accepted on November 14th.

At the time of admission the chief complaints were weakness, shortness of breath, pain in the right and left shoulders, and a spasmodic cough with only very scanty, mucoid sputum. The temperature was 103.2°; pulse 132; respirations 28. The patient was somewhat drowsy and quite irritable.

Physical examination.—Marked emaciation, noticeable pallor, some cyanosis of the lips,

cheeks and nails. The knee jerks were hyperactive. The spleen was not felt. The cervical glands on the right side were markedly swollen and tender, one being about the size of a small walnut; enlarged on the left, but not nearly so markedly.

The chest was poorly nourished; the respiratory excursion was moderate in extent and symmetrical. There was rather minimal impairment of resonance in both upper lobes and more marked impairment at both bases. No râles were heard.

Laboratory reports.—The sputum was mucoid in character; negative for tubercle bacilli, on several examinations. The urine showed a trace, increasing later to one plus, of albumin; no casts. Blood count: red blood corpuscles 1,560,000 per c.mm.; white blood corpuscles

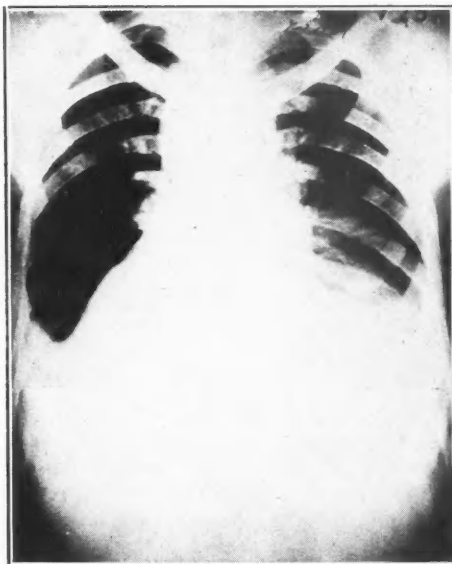


FIG. 1

4,150; polymorphonuclears 25 per cent; small lymphocytes, 37 per cent, large, 30 per cent; eosinophiles 0; transitionals, 8 per cent. The Widal test was negative.

Stereoscopic x-ray of the chest.—This showed large discrete masses projecting from the mediastinum on both sides. (See Fig. 1.) These had the appearance of being glandular

in origin. The right dome of the diaphragm was elevated. There was a diffuse pleural thickening over the right base and a small present or past effusion at the left base.

During residence the temperature remained continuously high and, excepting the few days preceding death, usually reached 104° or higher. Blood counts were repeatedly carried out and showed a gradual increase in the percentage of lymphocytes, the last one, done on December 26th, three days before death, giving only 10 per cent of polymorphonuclears and 87 per cent lymphocytes. In December there was a development of pleural fluid, first on the right side, which rapidly became massive (see Fig. 2), and later a smaller effusion on the left.



FIG. 2

A quantity of clear straw-coloured fluid was aspirated on one occasion, which was reported negative by the concentration method for tubercle bacilli. Ascites and enlargement of the liver and spleen developed rather rapidly. The patient was seen by two different consultants and acute lymphatic leukæmia, Hodgkin's disease, and lymphosarcoma were all considered. It may also be mentioned that on the first examination miliary tuberculosis was thought a possibility, but this could be fairly well discarded after viewing the skiagram of the chest. The patient steadily retrogressed and died on January 1, 1930.

Extracts from the autopsy report.—The abdomen was distended. There were numerous hard, moderately enlarged glands on both sides of the neck. No other glands were palpable. There was a large amount of clear fluid in the abdomen. The liver and spleen were tremendously enlarged. The omentum and peritoneum were covered with fibrinous exudate, and there was a large quantity of fluid, clear, in both pleural spaces. A fibrinous exudate was present over the pleuræ. Adhesions were noted between the upper and middle lobes on the right side. The pericardium was distended with 15 to 20 oz. of clear fluid; an exudate on the anterior wall. The heart was small and contracted. *Mediastinum*—broad and solid; above the heart is a dense mass, three inches in width, and quite firm, which appears to be of glandular origin.

Report from the Pathological Laboratory of the Institute of Public Health, London, Ont. (Jan. 20th, 1930).

"Cervical glands.—Sections of the glands show almost complete necrosis, there being only a narrow rim about the outside of the section. The type of necrosis is that referred to as coagulative necrosis, seen in tuberculosis. Two or three ill-defined giant-cells are noted about the edge of the section.

"The mediastinal glands show a similar picture but no giant-cells are noted.

"Liver.—Sections show one large area of coagulative necrosis. About this area there is a moderate infiltration of small mononuclear wandering cells. Scattered throughout the remainder of the sections are small areas of necrosis with a slight lymphocytic infiltration about each. A few well defined giant-cells are seen and these areas are characteristic of miliary tubercles.

"Spleen.—There were areas of coagulative necrosis throughout. No giant-cells are noted and the lesions seen are larger and appear older than the smaller lesions seen in the liver.

"Pleura.—The section shows no muscular tissue, but consists of vascular granulation tissue, showing considerable necrosis with considerable lymphocytic infiltration.

"Sections were stained by Ziehl-Neelsen's technique. The section from the pleura showed one area which contained numerous acid fast

baecilli, characteristic of *B. tuberculosis*. No acid fast organisms were found in other sections."

Diagnosis.—Tuberculous adenitis; miliary tuberculosis of the spleen and liver; tuberculous pleuritis.

COMBINED THERAPY IN MALIGNANCY

By L. J. CARTER, M.D., F.A.C.P.,

Brandon

The following case report illustrates well the good results which may frequently be obtained by a combination of measures in the treatment of malignancy.

Mr. J. G., aged 65, came to the Bigelow Clinic, Brandon, on October 24, 1927, complaining of a small lump inside the left cheek. This had been noticed for one week only, and was neither sore nor painful. The nodule was electrocoagulated, and he was ordered to return in two weeks for radium treatment of a leukoplakia on the adjoining upper alveolar margin.

He did not report until March 20, 1928, five months later, when there was an advanced carcinoma of the alveolar margin of the left upper maxillary bone. His general condition was very poor. The red blood count was 3,410,000 per c.mm. He was given an intensive dose of radium; five needles, each containing 10 milligrams of radium, were imbedded deeply in the tumour for 24 hours. During the next month seven x-ray treatments of moderate penetration (135 K.V.) were given over the affected area and the regional glands.

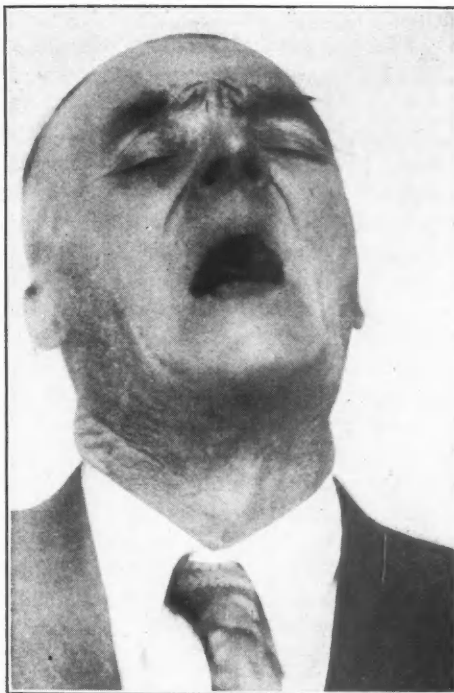
On May 18, 1928, the sloughing area was electrocoagulated, and dead bone removed. During the latter part of May and June further x-ray treatments were given.

On October 8, 1928, the patient reported. His general condition was somewhat improved. The red blood count was 3,800,000. He stated that some time previously the alveolus had come away *en masse*, leaving a clear-edged cavity, with no evidence of cancer to be seen.

From October to December six more x-ray treatments were given.

The patient reported on April 15, 1930, two and a half years after the original lesion was

treated, and two years after the recurrence was first treated, with a condition as shown in the accompanying illustration. The cancer area is represented by a smooth walled cavity, lined



with mucous membrane, having as its roof the floor of the orbit, and communicating with the nasal and buccal cavities. There is no evidence of carcinoma. The general health is good. The red blood count is 4,750,000.

A REPORT OF AN UNUSUAL CASE OF HÆMORRHAGIC DISEASE OF THE NEWBORN

By GORDON CHOWN, B.A., M.D.,

Winnipeg

Personal and family history.—Baby R., female, born on February 6, 1930. She was a full term baby and the labour was normal; weight at birth, 9 lbs., 4 oz. She was the first child of a second marriage. Two other children by a first marriage were alive and well. There was no history of hæmorrhagic diathesis in the families.

Present illness.—The routine clotting time of

the blood, taken on February 9th, was reported as three minutes. The infant nursed well until 6 a.m., February 10th, when the breast was refused. At 4 p.m. the same day it was noticed that the breathing was difficult and laboured, with slight cyanosis about the lips.

Physical examination.—There was definite dullness and diminished breath sounds over the entire left chest, indicating the presence of fluid. An x-ray report by Dr. Digby Wheeler showed the heart and great vessels to be displaced to the right; the right half of the diaphragm, normal; the left half of the diaphragm, obscured. The left chest was completely opaque, suggesting extensive effusion.

At 9 p.m., the same day, I aspirated the chest and withdrew 60 c.c. of bloody effusion, and administered 30 c.c. of the father's blood subcutaneously. Clotting and bleeding time the same evening were again reported respectively as three minutes and two minutes. Expressed breast milk was fed by a dropper with 10 per cent glucose solution *ad lib.* between the feedings.

February 11, 1930. At 10 a.m. the breathing was somewhat laboured, with physical signs of fluid again evident. The temperature was normal. An additional 30 c.c. of the father's blood were administered subcutaneously.

At 3 p.m. a mild hæmorrhage from the cord was reported. Adrenalin dressings were applied. The hæmorrhage persisted for twelve hours.

At 6.30 p.m. the respiratory distress was more pronounced and an additional 45 c.c. of bloody effusion were aspirated. The bleeding time was again reported as 3 minutes; clotting time 3 minutes.

The infant was discharged, February 20, 1930, having regained its birth weight. Physical examination of the chest was negative; this was confirmed by x-ray taken on the day of discharge from hospital.

April 10, 1930. Weight 11 lbs., 10 oz.; a normal baby.

SUMMARY

The case is reported because of the very unusual location of the hæmorrhage, *viz.*, the pleural cavity, and a later associated bleeding from the cord, with a normal bleeding and clotting time on three different occasions.

I am indebted to Dr. J. D. McQueen, with

whom I saw the infant in consultation, for his co-operation and permission to report the case.

THREE CASES OF CEREBROSPINAL MENINGITIS IN THE SAME FAMILY

By SAMUEL MIRSKY, M.D.,

Ottawa

The incidence of more than one case of cerebrospinal meningitis in a house is not common. Osler¹ observed, "It is very rare to have more than one or two cases in a house", though in sporadic outbreaks he said, "two, three and even five cases may occur in succession in one family."

In the Texas epidemic of 1912,² of 2,135 cases 2 cases each appeared in 103 houses, 3 in 23 houses, 4 in 7 houses and 5 in 2 houses. Reece,³ quoted by Rolleston and Andrewes, reports that of 3,617 cases only 100 instances of multiple cases in a house occurred. In Ojuela, Durango, Mexico,⁴ from March to July, 1929, they had 30 cases and in not one instance did two cases occur in one house.

The three cases reported here occurred at Stonecliffe, a small village in Ontario. There were 5 children and 2 adults in the house. Richard, age 5, took sick on October 28, 1929, with fever, headache, stiff neck and vomiting. A physician from the nearest town was called and, in view of the epidemic of poliomyelitis prevailing at that time, made a diagnosis of poliomyelitis and sent the child to Ottawa for treatment. He was admitted to the Strathecona Hospital October 30th, at about 5 a.m. From the clinical appearance, and the turbid spinal fluid, cerebrospinal meningitis was diagnosed and serum was at once administered intrathecally. Meningococci were later isolated from the fluid.

The next day, Dr. D. A. Whitton, of Ottawa, who was planning to go on a hunting trip to Stonecliffe, was notified that a brother of the child under our care was sick with the same complaints. Dr. Whitton communicated with the Hospital and, on hearing of our findings, took with him a lumbar puncture needle and anti-meningococcus serum. On his arrival at Stonecliffe he found two sick children. James, aged 3, had the clinical signs of meningitis and

a purulent spinal fluid and he gave him the serum intraspinally. Robert, the youngest child, 18 months old, was very ill, with high fever, but no meningismus. Dr. Whitton sent them both to Ottawa.

On admission to the Hospital, November 1, 1929, James showed all the signs of acute meningitis and his spinal fluid was turbid. Meningococci were later isolated from the fluid.

The youngest child, Robert, appeared very ill, but did not show the same characteristic signs of meningitis as did his two brothers. His spinal fluid was clear, with cell count of 12. However, he was treated as a case of cerebrospinal fever and the subsequent laboratory findings showed Gram-negative diplococci, but no intracellular organisms were found. He was given 20 c.c. of anti-meningococcus serum intrathecally, on admission. November 5th, four days

later, his temperature, which had been subsiding, again rose to 103°. His neck became stiff and his cell count rose to 47. Serum therapy was again instituted and maintained. It was felt that under these circumstances, the findings were sufficient to make a diagnosis of cerebrospinal meningitis in the third case.

All three cases made an uneventful recovery under serum treatment.

No other cases to our knowledge occurred in that district at that time nor did any subsequently develop.

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Retrospect

INTESTINAL OBSTRUCTION

By PHILIP G. SILVER, M.D.,

Montreal

Numerous articles on intestinal obstruction have appeared in the medical literature during the past year. It is my purpose to review these and present some of the problems which have been encountered in the investigation of this condition.

Acute intestinal obstruction may be of mechanical or paralytic origin. According to Foster,¹ the mechanical type may be subdivided into (a) acute simple obstruction, as produced by bands or kinks, and (b) acute strangulation, as in volvulus and strangulated hernia. It is a well known fact, both clinically and experimentally determined, that in cases of strangulation the symptoms are more acute and death more rapid, owing to the early development of toxæmia. In acute simple obstruction, on the other hand, the early symptoms are referable to dehydration and changes in the blood chemistry. Signs of toxæmia develop much later.

If to a dog in which a simple obstruction of the small bowel has been produced neither food nor fluid is given by mouth, it lives in comparative comfort and without symptoms for a period of approximately three weeks and dies apparently from simple inanition. The blood chemistry in this animal shows very little change

from normal as regards chloride and urea nitrogen content. If, however, such a dog be allowed food and fluid by mouth, it begins to vomit, tetany-like symptoms and shock develop, and it dies within a few days. In this animal examination of the blood shows a steady decrease in the blood chlorides and a terminal increase in the urea nitrogen content. The oral administration of food or fluids stimulates the secretion of gastric juice, which is rich in chlorides. On account of the obstruction the gastric juice is vomited and there results a steady depletion of the chlorides. That this condition of *hypochloræmia* is responsible for the symptoms may be proved by the administration of sodium chloride intravenously in sufficient amounts to restore the normal chloride content of the blood, with resultant relief from the symptoms. Naturally, in addition to the condition of hypochloræmia, there must be considered the effect of dehydration, which may become very pronounced and add to the severity of the condition. (Orr and Haden²)

In this connection it is well to mention the belief of McIver and Gamble,³ that the symptoms are not the result of loss of chloride but rather of the loss of the electrolyte, namely, the sodium ion. They also believe that the loss of body fluids and the decrease of blood chlorides are in themselves sufficient to produce all the symptoms in cases of acute simple obstruction, without the addition of a toxæmia. This cannot be accepted in cases of acute strangulation, how-

ever, in which a severe toxæmia may occur without an accompanying alkalosis. (McVicar and Weir⁴)

The origin and nature of the toxin causing the toxæmia of intestinal obstruction remains unsettled. Various theories have been advanced regarding the origin of the toxin, which, it is generally agreed, develops in the lumen or wall of the intestine above the point of obstruction. Stone, Bernheim,⁵ and others believe that it originates in the intestinal mucosa. Whipple⁶ is of the opinion that the toxin is a proteose emanating from an injured intestinal mucosa. Sweet, Peet, and Hendrix⁶ believe it to be due to the action of pancreatic enzyme on proteins in the duodenum, since ligation of the pancreatic duct in such cases prolongs life.

It is the belief of many that the presence of bacteria in the lumen of the obstructed intestine is necessary for the production of the toxins. It is difficult either to prove or disprove this, since it has been impossible to keep an obstructed loop of bowel sterile. Williams⁷ brought forward the hypothesis that the toxæmia is due to the absorption of an exotoxin of the *B. Welchii* which multiplies in the stagnant bowel, and advocates the use of *B. Welchii* antitoxin in such cases. The fact that *B. Welchii* can be recovered from the normal jejunum in only 17 per cent of cases, while in cases of obstruction it can be found in 94 per cent of cases (Stabins and Kennedy⁸) would seem to support this view. Substantiating this hypothesis also is the claim of Copher, Stone, and Hildreth,⁹ that by the early administration of *B. Welchii* antitoxin they were able to prolong the life of dogs with experimentally produced obstruction from 2.3 days in control animals to 4.6 days in the "immunized" animals. Other investigators have been unable to confirm these findings.

McIver, White and Lawson¹⁰ were unable to demonstrate that *B. Welchii* antitoxin had any effect in prolonging the life of cats with obstruction. Moreover, they found that, although cats are relatively immune to *B. Welchii* toxin, they succumb quickly to the toxæmia of obstruction. Oughterson and Powers¹¹ were unable to support the hypothesis that the toxin of *B. Welchii* is the lethal agent in the toxæmia of intestinal obstruction. Their experiments included, amongst others, the intravenous injection of obstructed intestinal contents into normal rabbits and into rabbits protected by inoculation with *B. Welchii* antitoxin. They found no appreciable differences in the results obtained in the two series.

Owings and McIntosh¹² employed numerous tests in an attempt to arrive at decision as to the value of this antitoxin in cases of obstruction. Simple obstruction was produced in dogs which were then given the antitoxin daily. A similar procedure was followed in dogs where an isolated

loop of intestine was obstructed. Loop toxin and *B. Welchii* antitoxin were mixed and injected intravenously into normal dogs. Loop toxin was injected intravenously into dogs immunized by *B. Welchii* antitoxin. The degree of anæmia produced by injection of loop toxin in normal dogs was compared with that produced by injection of *B. Welchii* toxin. The results of these experiments led the investigators to the conclusion that the use of *B. Welchii* antitoxin does not prolong the life of dogs with intestinal obstruction; that the antitoxin does not neutralize the toxins of an obstructed intestinal loop, either *in vivo* or *in vitro*; that the minimum lethal dose of loop toxin is much less than the dose of toxin of *B. Welchii*; that the hæmolysis produced by *B. Welchii* toxin is greater than that produced by loop toxin.

Not only is the origin of the toxin of intestinal obstruction still obscure, but the actual nature of the toxin also remains in doubt. Wangenstein and Loucks¹³ have shown that the toxin has an effect similar to that of histamine, in causing a great fall in blood pressure. Cutting¹⁴ states that it is possible to isolate from the contents of an obstructed bowel a substance which is not present in the contents of a normal intestine. This substance has fairly definite physical and chemical properties and, when injected into healthy animals, produces a clinical picture similar to that of the toxæmia of intestinal obstruction. It is water-soluble, thermostable, does not pass through a colloidal membrane, and is precipitated by alcohol. These qualities do not, of course, establish the exact nature of the substance, which may be assumed to be the toxin of intestinal obstruction. Most investigators regard it as a split protein. Various views are held that it may be proteose, histamine, nucleoprotein, bacterial exotoxin, alkaloid, or ptomaine.

The relationship of the adrenal glands to the toxæmia of intestinal obstruction is of interest. For several years the ability of these glands to combat toxins has been under investigation, and Cutting¹⁴ has recently reported the results of experimental work showing their effect on the toxæmia of intestinal obstruction. The toxin prepared from the contents of an obstructed small intestine was injected into rabbits intravenously. It was found that the lethal dose of toxin is much less for doubly adrenalectomized animals than for normal ones. The adrenal glands evidently serve a definite function in combating the toxæmia produced by the injection of this toxin.

It is, clinically, a well recognized fact that the higher the level of the obstruction, the more marked are the symptoms and the more rapidly fatal the course of the disease if left untreated. Obstruction of the duodenum immediately distal to the entrance of the biliary and pancreatic

ducts has been found to be the most severe of all. Several factors must be considered in attempting to explain this fact.

The first factor is one of fluid loss.

In obstruction low down in the small intestine it is possible that, until the intra-enteric pressure becomes too great, there may be a certain amount of re-absorption of the biliary, pancreatic and duodenal secretions. These secretions are considerable in amount and are rich in mineral salts. In dogs there is a daily secretion of approximately 500 c.c. of bile, 500 c.c. of pancreatic juice, and 100 c.c. of duodenal juice. If the obstruction be high up, these secretions are immediately lost by vomiting.

Jenkins¹⁵ reports the effect of short-circuiting the biliary, pancreatic, and duodenal secretions below the point of obstruction in cases of high intestinal obstruction. Dogs in which this had been done lived for a period of 12 to 33 days, while without the short-circuiting the average duration of life was 5 days. The weight of the dogs fell to as much as half the normal. Blood chlorides fell gradually. The urea N. showed a preliminary fall for about 10 days and then rose gradually to a high level. The cause of this prolongation of life is not clear. Either these secretions are responsible for the formation of a toxin or, when resorbed in the lower bowel, they prevent a marked upset in the water and mineral balance of the body.

The second factor to be considered is the effect of bile or the absence of bile in the intestinal tract.

Brockman¹⁶ feels that bile coming into contact with the intestinal mucosa is a necessity. He claims that by the rectal injection of bile cases of paralytic ileus were improved clinically. Meyers and Rosenblatt¹⁷ report that, in a limited number of experiments, it would seem that the introduction of human bile into the intestinal tract of dogs with intestinal obstruction caused the dogs to live longer and appear better clinically. Whether the bile introduced in this way acted merely as a substitution of missing factors, or whether it acted as a detoxifying agent, they were not prepared to say. These results are not substantiated by the experiments of Eisberg and Draper,¹⁸ and others who short-circuited the bile into the intestine below the point of obstruction without any appreciable effect on the duration of life. Further investigation is necessary to clear up this point.

The third factor pertains to the increase of intra-enteric pressure which occurs in cases of intestinal obstruction.

Raine and Perry¹⁹ have shown that in rabbits an increase of intra-intestinal pressure provokes hyperperistalsis, which in turn stimulates secretion. Moreover, the resulting distension diminishes the capacity of the intestinal wall for resorption of these secretions. For this reason

an increase of the intra-intestinal pressure shortens the life of rabbits with obstruction. A decrease in the intra-intestinal pressure in the obstructed bowel prolongs life, because secretion is lessened and resorption improved. It was found also that rabbits recover more rapidly from intestinal obstruction when allowed to resorb the contents of the intestine after the obstruction is relieved. Removal of the intestinal contents means the loss of secretions rich in organic salts. These contents are not toxic when placed in a normal bowel, or even when left in a previously obstructed intestine, provided there is no increase of the intra-enteric pressure. Thus in human beings suffering from obstruction the contents of the obstructed loop are removed in order to reduce the intra-enteric pressure rather than to decrease absorption of toxins.

The effect of increased intra-enteric pressure is not uniform throughout the entire intestine. The colon, having in part a storage function, is capable of marked distension without injury. In the small intestine, on the other hand, especially the duodenum, circulatory damage results from even the least degree of distension.

Dragstedt, Lang and Millet²⁰ found that distension of the intestine interferes with the flow of blood in the vessels of the intestinal wall, and that this interference (as shown by blanching) is most marked in the duodenum and least in the colon. This variation appears to be correlated with a variation in the distribution of the blood vessels in the intestinal wall. In the duodenum the blood vessels pierce the muscularis close to the line of the mesenteric attachment and run beneath the mucosa for more than two-thirds of the circumference of the bowel. In this situation they are greatly exposed to the effect of pressure exerted from within the bowel. In the colon, however, the blood vessels run beneath the serosa for almost the entire circumference before piercing the muscularis to reach the submucosa, and are better situated to withstand an increase of intra-intestinal pressure.

Morton²¹ has shown that the duodenum has a much richer vascular supply than the ileum. Not only are the larger vessels more numerous but the capillary network is more extensive. This permits a duodenal loop to take up and retain larger amounts of toxin than a similar loop of ileum. The rate of secretion was found to be much greater in the duodenum than in the ileum, and as a result increased intra-intestinal pressure is more rapid in development in the duodenum. Thus, increased intra-intestinal pressure occurs most rapidly in the duodenum and jejunum which from their anatomical structure are least able to withstand this pressure.

The exact pathway of absorption of the toxins in an obstructed loop still remains unknown. The most widely accepted theory is as follows.²¹ There is first a latent period with no symptoms.

During this period fluid is secreted into the obstructed loop and bacterial growth progresses. Histamine-like bodies are formed and absorbed into tissue spaces of the intestinal wall. The blood capillaries become distended and fluid escapes from them into the tissue spaces. The toxins are retained in the intestinal walls due to circulatory and lymphatic stasis until such time as the increased intra-enteric pressure forces them out into the systemic circulation faster than the body can detoxify them.

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Clinical and Laboratory Notes

A METHOD OF PREPARING AND EXAMINING THICK FILMS FOR THE DIAGNOSIS OF MALARIA

Slides.—Slides should be well cleaned. It is a good plan to wipe slides, cleaned in the ordinary manner, with an alcohol-wet cloth to free them from grease. Old slides are usable if not fogged or scratched. If any dust gets on the slides in carrying them to the field, brush each one on a clean cloth just before using.

Select slides of a proper length to fit the slide box, and sufficiently thick to fit the mechanical stage of the microscope.

Collecting blood specimens.—It is essential that the blood be free from dirt coming from the skin, from dust, or other débris. Cleanse the skin with alcohol and gauze. Let it dry. Prick the skin deeply enough to allow the blood to well up in a large drop. Touch the slide to the upper part of the drop, avoiding as far as possible the blood which has been in immediate contact with the skin. In any case, avoid rubbing the skin with the flat of the slide or scraping it with the edge.

The blood can be spread sufficiently by dragging the drop on the surface of the slide, or the drop can be spread with the sticking needle or corner of the labeled end of the next slide. Put on a large drop, three or four times as much as one would use for a thin film, and spread it over an area 1 to 1½ centimetres in diameter. It does not matter whether or not the blood is

thicker in some parts of the film than in others, and a good deal of latitude is permissible in regard to the amount of blood used; but one should avoid the not uncommon error of using a very small amount of blood and then spreading it so much that it becomes the equivalent of a thin film. If the slide is subsequently to be stained in the upright position, place the thick drop with its lower margin about one-half centimetre from the end of the slide, or a good deal of stain will be required to cover the specimens.

Drying films.—Thick films should be dried enough to make them adhere during the staining, but too much drying will prevent a clear staining of the parasites.

Staining.—It is essential to use a good quality of Giemsa stain. The water used for diluting it must be neutral, or only slightly alkaline, and must be nearly or quite free from salts.

The stock Giemsa solution may be made up by the following formula: Dissolve Azur II eosin, 0.3 gram, and Azur II, 0.08 gram, in 25 c.c. of pure anhydrous glycerin at 60° C.; then add 25 c.c. of absolute methyl alcohol (C. P., acetone-free) at the same temperature. Allow the glycerin-methyl alcohol solution to stand overnight and then filter.

The Azur II may be omitted from the formula of a Giemsa solution to be used for thick films. According to Giemsa,¹ a glycerin suitable for this stain should have a specific gravity of 1.26 and a water content of only 1.5 per cent.

1. *Centralbl. f. Bakteriologie. I Abth. Orig.* **91**: 343, No. 5, 1924.

In recent years we have been using a prepared Giemsa solution. We prefer Azur eosin, Gruebler.² Stock solutions, if kept in well-stoppered containers, remain in good condition for months, even in the Tropics.

Dehæmoglobinization previous to staining or fixation of films is unnecessary. Neither alcohol nor any other fixing agent should be allowed to touch the thick films before dehæmoglobinization, and are not used at all in the method described below.

If only a few slides are to be stained, a Coplin jar or other convenient staining dish will serve. To stain one block of 25 slides places 60 or 70 drops (about 1.3 c.c.) of Giemsa stock solution in a clean glass vessel and pour in 75 c.c. of water. This ensures sufficient mixing. Then stand the block in the diluted stain and leave for about one hour.

Dilute the stain immediately before use and use it only once. To dilute the stock Giemsa solution, use distilled water, neutralized or at most but slightly alkaline (p^H 7.0 to p^H 7.2). Rain water caught in the open (not from a roof), melted snow, or melted ice made from distilled water, will serve, especially if boiled until free from carbonic acid. In any case, see that the water does not contain free acid. If it is not convenient to make a hydrogen-ion determination, a single indicator, phenol red, neutral red, or an alcoholic solution of hæmatoxylin will serve. One may neutralize with a 1 per cent solution of sodium or potassium hydroxide or with dilute hydrochloric acid. Distilled water is often acid, and it is well to test the reaction of any water before using it. A tap water not too heavily impregnated with salts may give good results, but salts (especially sodium or magnesium chloride) tend to precipitate part of the stain.

Decolourization after staining is not always necessary. A sufficient decolourization is usually obtained by setting the block (while the slides are still wet from the stain) for five minutes in clean water, preferably the same as that used for diluting the stain. These staining directions will serve for most cases, but a good deal of latitude is permissible if one observes the essentials—a good Giemsa stain and a proper diluting water.

Quick staining of thick films for early diagnosis.—Spread the blood, or a part of it, a little more thinly than for ordinary thick films. Dry. Lay the slide flat, film side up, and pour on a

generous quantity (3 or 4 c.c.) of freshly diluted Giemsa stain. Stain 15 to 20 minutes. Wash with water cautiously so as not to loosen the film. Dry and examine.

Preservation of films after examination.—If it is desired to preserve a preparation, warm the slide, wash off the immersion oil with xylol, and quickly wash off the xylol with absolute ethyl alcohol. Blot or dry quickly. Cover the films with liquid petrolatum or petrolatum (vaseline) and keep them away from the light. The alcohol is used to prevent the formation of a ground-glass deposit, which sometimes occurs after the use of xylol alone; and if a cold slide is washed with xylol and alcohol, enough water may condense on it to dilute the alcohol and partly decolorize the film. Where it is desired to avoid the use of cedar oil for immersion, liquid petrolatum, heavy (U. S. P. IX) will prove to be a fair substitute. In that case the same medium will serve for examination and preservative.

The advantages of the thick film method, especially for malaria surveys, have been recognized by all who have given it a fair trial. An assistant may be easily taught to collect good specimens, and the method has been widely and successfully used in field work. Much time is saved in the examination of specimens. When parasites are at all numerous they are usually picked up in the first thick-film field; when they are rare, they are often detected in the thick film when they might have been missed in a thin film or found only after a long search. The chief purpose of the thick film is, of course, the diagnosis of malaria rather than the study of the characteristics of malaria parasites, a purpose for which the thin film is more suitable.

Recognition of parasites in the thick film.—The difficulty of learning to recognize parasites in the thick films has been overestimated. Examiners familiar with the appearance of parasites in the thin films have learned to do thick films in a day or two.

A few general directions may be of particular assistance: Except in the case of crescents, it is unsafe to call anything a parasite unless it shows a red chromatin dot, or mass, associated with blue cytoplasm. The latter, of course, is not always in the form of a ring; it may appear as a round or oval body and is not uncommonly irregular in form. With increasing experience and in clean preparations one can sometimes take into consideration pigment alone or pigment associated with cytoplasm only.—Abstr. M. A. Barber and W. H. W. Komp, Rept. No. 1319, *Pub. Health Rep., U. S. A.* 44: 2330, Sept. 27, 1929.

2. This stain may be obtained in America of the American Kreuger and Toll Corp., New York, under the name of "Azur Eosine Solution for Romanowsky-Giemsa Staining." An excellent Giemsa solution can also be obtained from Dr. Karl Hollborn, Leipzig.

Editorial

ON SERUM IMMUNITY AGAINST MEASLES*

OF measles it has been said that it is one disease for the rich and another for the poor. Measles in the nursery, occurring in a child of previous good health, entails as a rule only a short period of discomfort and confinement. Measles, among poorly nourished children, in tenement houses, ill ventilated slum dwellings and crowded institutions is very different, and in England it heads the list of the lethal acute specific infections of young children. The mortality in children below three years is many times greater than in children between five and ten years. The reason in a great majority of cases is due to the greater incidence and fatality of pneumonic conditions amongst the younger aged group. The exact nature of this complication, however, has not yet been ascertained. By many it is regarded as a superadded specific infection. With us in Canada the actual mortality of measles is comparatively low; and the average number of deaths occurring annually from this disease is stated to be under six hundred. It is to be feared however, that this by no means represents the damage in the way of impaired health which often follows an attack. During the past decade serum from patients who have convalesced from the disease has been widely employed throughout Europe and America as a protective against the spread of the infection in hospitals and institutions. The immunity thus obtained unfortunately is found to be temporary, lasting only for a few weeks. Moreover, it is not always expedient or

practicable to take blood from small children who form the bulk of measles patients, and adults fresh from a sharp illness cannot always be persuaded to be bled for the benefit of all and sundry.

Unfortunately, also, a measles epidemic arises and attains its maximum incidence with great rapidity, and, even with careful management and alertness in finding sources of supply, it is doubtful if a reserve supply of serum could be maintained sufficient to meet the needs of wide-spread epidemics. Whilst the supply of donors of the most efficiently protective serum is apparently limited to those who have recently passed through an attack of the disease, it has been found that the blood of parents who have had measles at an early age may be used with benefit, and though this blood may not prevent an attack it certainly renders the attack comparatively mild, and a definite attack produces a much to be desired permanent immunity for the future. An added value to this scheme lies in the fact that it brings the sero-prophylaxis of measles within the range of measures practicable to the family doctor. One or other of the parents is almost certain to have had an attack of the disease, and thus a donor is immediately available. Between 25 and 30 c.c. of blood may be drawn from a vein at the elbow into a sterile syringe, under aseptic precautions, and half of it injected, intramuscularly into the buttock or other suitable area, and the other half into the same area on the other side. No testing of the blood is necessary. Although a hæmatoma may be produced this undergoes absorption in the ordinary way, and any temporary æsthetic objections should not be allowed to override the solid benefit obtained by a permanent immunity against the disease.

A. D. B.

* Stock, P., The Mechanism of a Measles Epidemic, *Lancet*, 1: 796, Apr. 12, 1930.

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DIET AND RESEARCH

THIS is pre-eminently the age of faddists, cultists, and propagandists. We have always had such among us, of course, but never so many as now. Indeed, one is tempted to conclude that there is some inherent peculiarity in the Anglo-Saxon temperament which impels some of us to accept implicitly new suggestions, or, on the other hand, to deny established truths. Two of our fetishes are liberty of thought and freedom of expression, principles excellent enough in themselves but troublesome and even dangerous when uncontrolled by knowledge and fair-mindedness. Self-confidence and inability to appraise evidence are two of the hall-marks of the semi-educated, and we have abundant indications of these defects in our race. To these we might add credulity. In spite of the spread of knowledge quackery flourishes as rampantly as ever. And now that medical and allied topics are being daily ventilated in the press, undoubtedly in the main for the reasons that they are of interest to the readers, the danger suggested in the above reflections does not become any the less. To obviate it we need demonstrated fact and authoritative pronouncement.

All of this may be applied to the subject of diet, whether such diet is advocated for the maintenance of life and the preservation of health or for the cure of disease. We have vegetarians, fruitarians, even "grapar-ians;" milk and orange juice, beef and water, and water only, have their advocates, until one is tempted to exclaim, with Bottom, "Good hay, sweet hay, hath no fellow." And now that vitamins have taken hold of the popular fancy things are by that much the worse. The new knowledge in regard to foods and yeast is being exploited to the uttermost for commercial reasons, and amid the welter of truths, half-truths, and whole lies, it is hard for the average medical man, not to mention the average layman, to sort out the grain from the chaff. Here, of course, is where the exact knowledge of the laboratory worker comes in. At present, only by physiological assay can we appraise the value of food-stuffs in regard to their vitamin-content, and only

by experiment can we determine what constitutes a properly balanced ration. Such knowledge is gradually becoming available, and when it is finally accepted and becomes generally disseminated we may hope that scientific exactitude will replace half-baked generalisations, and exaggerated claims. We are much in need of such exact knowledge, for, as Prof. A. T. Cameron, of Winnipeg, pointed out in a recent editorial in this *Journal* (22: 686, May, 1930) vitamins are not necessarily beneficial and innocuous. There is evidence, in fact, that overdosage with vitamins may be harmful.

It is not necessary to take up again here the story of the discovery of the various vitamins or to discuss in detail the role they play in metabolism. This is sufficiently well known. We should like, however, to refer to certain points of more than ordinary importance brought out by Prof. Edward Mellanby, one of the most eminent of the workers in this field, in an address given to the Kenya Branch of the British Medical Association at Nairobi last August.* There is much of practical value in this address, and it is the more interesting in that Professor Mellanby in some directions goes counter to certain rather widely accepted views.

The purpose of Professor Mellanby in his lecture was to show that "diet, in addition to supplying material for growth and maintenance of the body and the necessary energy for the performance of its work, also contains two groups of substances—one which tends to produce pathological change and ill health, and the other which helps the body to protect itself, not only against these toxic factors but also against other disease-producing agents, such as micro-organisms."

In discussing the important topic of the dietetic factors responsible for the proper or improper calcification of the bones and teeth, two factors come into play—vitamin D and the elements calcium and phosphorus. Unless both these factors are at work defective calcification will result. Neither alone

* *Brit. M. J.* 1: 677, April 12, 1930.

is sufficient. However much calcium and phosphorus is present in the food, unless there is sufficient vitamin D, or unless the body is exposed to sunlight, defectively calcified bones and teeth will be found. Milk, as a vehicle of calcifying substances, is better than butter.

One group of foods, however, according to Professor Mellanby, is notable, as it interferes with the deposition of calcifying salts in the bones and teeth. These foods are the cereals. The worst of these, so far as animal experiments indicate, is oatmeal (*pace* Scotsmen) and the best, or at least the least harmful, is white flour. Will this open up again the controversy as to the respective merits of white flour and whole wheat? The embryo or germ of wheat, Indian corn, and probably of other grains, is more baneful than the endosperm. Professor Mellanby, however, emphasizes the fact that the calcifying effect of vitamin D, whether it forms part of the diet or is supplied as the result of the activation by sunlight of ergosterol in the skin, will always, if present in sufficient quantity, antagonize the decalcifying action of cereals. The inclusion of much cereal in the diets of children lessens the degree of calcification of their teeth and promotes caries.

Another interesting line of thought is opened up by the study of the degenerative changes that occur in the spinal cord in ergotism and after feeding with certain cereals. Professor Mellanby found that the nerve toxin in question was present in normal rye germ as well as in the ergotized rye germ, though in much greater amounts in the latter. Most cereals contain this toxin including oatmeal and white flour, and there is much of it in the embryo of the wheat. The effects may be prevented by foods such as egg yolk, butter, or cod-liver oil, which contain vitamin A. Similarly, the lesions of pellagra are possibly due to a positive harmful factor in certain cereals, including

maize, and this harmful factor is in normal people counteracted by a protective substance of the nature of a vitamin, or possibly, vitamins, including A and B₁. Professor Mellanby was unable to obtain degenerative lesions in the cord by the use of yellow maize, possibly due to the fact that it contains carotene, a substance that acts like vitamin A. With regard to the blood changes and the cord degeneration found in pernicious anæmia Professor Mellanby makes the interesting suggestion that here we have to do with failure on the part of the liver, the blood condition being due to the exhaustion of some specific water-soluble substance and the cord changes to a deficiency of a specific fat-soluble substance, possibly vitamin A.

Finally, new vistas have been opened up by Professor Mellanby's work in connection with immunity. It may be possible to enhance the protective power of the body against microbic invasion by the use of dietetic measures. He thinks that there is strong evidence that vitamin A has a definite effect in raising the resistance of the animal body to bacterial agents, and that a deficiency in this substance increases its susceptibility. It is important, therefore, that the food should contain abundance of vitamin A. Here should be mentioned, egg yolk, mammalian liver, cod-liver oil, milk, butter, suet, carrots and green vegetables. Unfortunately, vitamin A is a very unstable substance, and is apt to disappear rapidly, especially in high concentrations.

Such studies as these are of the highest value. It is to be hoped that they will be pursued farther, until we know more of the nature of the action of vitamins, and the bearing of food substances, with their contained vitamins, upon the maintenance of health and upon the problems of clinical medicine. Then, indeed, we shall know whereof we speak.

A. G. N.

RAYNAUD'S DISEASE ASSOCIATED WITH CHRONIC ARSENICAL RETENTION.—Arthur F. Kraetzer, New York, reports a case of Raynaud's disease in which there was associated a chronic retention of arsenic; the arsenic was accounted for by an unequivocal history of exposure to arsenical insecticides over a long period of time. Arsenic was demonstrated quantitatively by the Marsh test. Under sodium thiosulphate treatment there was

progressive improvement and finally complete disappearance of symptoms. Well known symptoms of chronic arsenical poisoning were present; namely, recurrent eczema, waxy pallor, injection of the tarsal conjunctivæ and garlic odor of the sweat. He concludes that as arsenic is a frequent contaminant of many articles used for food and other purposes, it should be searched for as the possible etiological factor in other cases of this syndrome.—*J. Am. M. Ass.* 94: 1035, Apr. 5, 1930.

A STUDY OF THE CONDITIONS MET WITH IN OPIUM ADDICTS*

THE subject of opium addiction in Canada has already been referred to in recent articles in our *Journal*, and in letters from correspondents. Its importance has been emphasized in the address of the Deputy Minister last year at the conference in Ottawa. The treatment of it must be regarded as one of the important problems facing the profession today.

It is with much interest therefore, that we have read the report of an investigation of some of the problems connected with this addiction which has been carried on in the university laboratories and in the wards of the Philadelphia General Hospital. The study was undertaken to determine what permanent effect on the system of the addict large doses of heroin or morphine had, when the addiction was persisted in over long periods, and to detect if possible, any deterioration in any of the organs of the body which might differentiate the addict from a normal person, either while he was under the influence of the poison or after its withdrawal, when he was suffering from the train of symptoms which then sets in. This characteristic train of symptoms following withdrawal begins as a rule with persistent yawning, lachrymation, sneezing, and restlessness; sweating, hot flushes and chills, vomiting and diarrhoea, cramps in the extremities and abdomen, and marked irritability follow, associated with a feeling of extreme weakness; weight is lost; diplopia is occasionally met with but death seldom ensues. These symptoms generally reach their height in about 72 hours, after which they subside slowly. Readministration of morphine in smaller amounts than before will within half an hour bring about complete relief.

The method of approach in these studies was as follows. An addict on admission to the ward was for a time given morphine hypodermically in sufficient quantities to prevent the appearance of any withdrawal symptoms. During this period a standard

series of studies was carried on. He was measured, weighed, his vital capacity was determined and the amount of the drug excreted in urine and faeces carefully estimated, and he was allowed to remain about the ward. The drug was then abruptly withdrawn for 48 hours, at the end of which the patient was again carefully watched and the same series of studies made. Afterwards the hyoscine method of treatment was employed, and at the end of about ten days when the patient stated that he was feeling well the series of studies were again carried out. The results may be summarized as follows. The study showed that morphine addiction does not appear to be characterized by evidence of change in the circulatory, hepatic, renal or endocrine functions. When it is considered that many of these subjects had been addicted for at least five years, and some of them for twenty, these negative observations are highly significant. The abrupt withdrawal of morphine was accompanied by only slight changes in the physiological mechanisms studied, changes which afforded no adequate explanation of the withdrawal symptoms. Just before the discharge from the hospital, careful studies indicated only the following few changes. The average leucocyte count was still high; a slight concentration of the blood still persisted; a slight rise in the average for the pH and in the lactic acid of the plasma was evident. There was however, a decided fall in the tests for efficiency.

If one may regard the difference between the amounts of the alkaloid administered, and those excreted as a measure of the quantity of morphine destroyed within the body, the results are extremely interesting. Daily administration of 15, 30, and 60 grains resulted in an average percentage elimination of only 8.7, 9.8 and 10.7 grains respectively, the ratio being remarkably constant. Faecal elimination of morphine fell far below the urinary level, and was too variable to justify general conclusions. The abrupt withdrawal, however, resulted in a rapid fall in the amount excreted by the urine, contrary to what one would expect if there had been any marked storage of the

* Light, A. B., Opium Addiction, General Summary XI. *Arch. of Int. Med.* 44: 870, 1930.

Some Aspects of Opium Addiction (Edit.) *J. Am. M. Ass.* 94: 340, Feb. 1, 1930.

drug in the system. It is notable that the general features just described were not changed during an attack of lobar pneumonia.

There appear to be substantial grounds, therefore, for the belief that if it were possible to cure the addict of his addiction, complete rehabilitation in time might be

expected. The results obtained from these investigations indicate the necessity for a study of the addict from some new point of view, in order to discover what factors induce and maintain the state of addiction, and what, on abrupt withdrawal of the drug, gives rise to the withdrawal symptoms.

A.D.B.

Editorial Comments

PERIODIC HEALTH EXAMINATIONS

A NEW FIELD OF HEALTH ACTIVITY

The following appeal, signed by the Deans of the various Canadian Medical Schools, is commended to the careful attention of our readers—(Ed.)

"For some years, men of vision amongst the laity and the medical profession have been studying with increasing interest the value of periodic health examinations.

This year, through the co-operation of six of the prominent life insurance companies of this country, a department has been established in the Canadian Medical Association to take charge of all details. Complete information has been already sent by letter to each registered practitioner in Canada.

The Medical Faculties of our universities have been actively interested in this phase of preventive medicine since its inception, and wish, at this time, to signify their enthusiastic approval. As university representatives, we earnestly appeal to our graduates throughout the length and breadth of Canada to co-operate heartily in furthering this work. This advance on the part of organized medicine in Canada will be watched by the medical profession throughout the world, as we are breaking new ground. Its success will mean the gradual development of a national consciousness of the need of individual health supervision by the recognized medical profession.

The success of periodic health examinations depends primarily on the care given by *each* practitioner in making *each* examination, on the judgment he shows in giving each health client a valuable health prescription, on the breadth of his own mental outlook and his ability to recognize and identify himself with a national health movement. Each member of the medical profession undertaking this work is a missionary of good health. We bespeak a missionary's zeal and enthusiasm.

John Stewart,

Faculty of Medicine, Dalhousie University;

Arthur Rousseau,

Faculty of Medicine, Laval University;

C. F. Martin,

Faculty of Medicine, McGill University;

L. de L. Harwood,

Faculty of Medicine, University of Montreal;

F. Etherington,

Faculty of Medicine, Queen's University;

A. Primrose,

Faculty of Medicine, University of Toronto;

A. B. Macallum,

Faculty of Medicine, University of Western Ontario;

S. W. Prowse,

Faculty of Medicine, University of Manitoba;

A. C. Rankin,

Faculty of Medicine, University of Alberta."

THE COST OF MEDICAL CARE

A number of publications of the Committee on the Cost of Medical Care have already appeared. A recent one, published by the Metropolitan Life Insurance Company, deals with the cost of medical care to the average working man's family. In January, 1929, the visiting nurses of the company called upon families located in the industrial centres of practically every state in the Union and distributed schedules in the form of calendars on which the policy holders were requested to keep a careful record, day by day, for six months, to show what their families paid out for doctors, nurses, medicines, for care of the teeth, for care of eyes, and for all other items for which expenses might be incurred on account of sickness or injuries. The families were visited each month in order to keep up their interest and to assist in keeping the records accurately. The calendars were collected in July, 1929. It is of some interest to note in this connection that

compared with other years 1929 was very favourable with respect to sickness.

Complete records were obtained from 3,281 families. Naturally, the expenditure was unevenly distributed, for 6 per cent of the families reported no expenditure at all, while 8 per cent of the families bore 40 per cent of the burden.

The marked difference per capita between large and small families is also worthy of notation. Where there are only two in the family the average expenditure per person was \$41.24; with eight members in the family the average per capita of expenditure was only \$10.44. It is not to be assumed that the larger family had less sickness, but rather that they utilized the services of free clinics, or else failed to call in medical aid when necessary.

The data indicate clearly one fundamental fact, that sickness is a hazard of life comparable to other hazards, such as fire, theft or accident, inasmuch as it bears lightly on some and almost unbearably on others. The obvious solution appears to be some form of insurance.

FRANK G. PEDLEY

LABOUR WOMEN AND MEDICAL PROBLEMS

The fact that labour women are thinking about medical questions is amply shown by the discussions at their recent conference held at Winnipeg. They are rebelling against things as they are; they ask for state medicine. Every year the state is taking on more and more medical responsibilities. Doctors think the change is a calamity or a blessing according to whether they are doing general practice in a constantly narrowing field or whether they are recipients of posts which give them regular hours and a sure income.

The labour women want mental defectives sterilized. Alberta, faced with crowded institutions for the feeble-minded, has put into practice its sterilization law.

Those who oppose vaccination and inoculation are a small but vocal minority; with more health education of the public their numbers are decreasing instead of increasing.

Birth control clinics attached to hospitals as asked for but will not be established as long as hospital boards are controlled by men.

It has always been the privilege of the laity to criticize the medical profession and it has always been the habit of the profession to carry on silently in the face of criticism. To meet labour in a debate would, perhaps, appear undignified and not quite the thing, but it might result in more tolerance on both sides.

L. A. C.

ROBERT SEYMOUR BRIDGES, O.M., M.B.,
F.R.C.P., D.LITT., LL.D.,

POET LAUREATE

There have been medical men who were at the same time poets, and there have been poets who were also medical men. Robert Seymour Bridges was notable in both rôles, and had, in addition, the pre-eminent distinction of being our only medical poet laureate. His death on April 21st last was, therefore, an event of more than passing importance.

Born in 1844, at Walmer, Bridges was educated at Eton and Oxford, taking his B.A. with a second in "Greats." He then entered as a medical student at St. Bartholomew's and obtained an M.B. degree in 1874. Far from being a visionary or pure intellectual, Bridges was a good example of the well-rounded product of a great English school and university. While at Eton he played cricket in Oppidan Wall and Field Elevens, and at Oxford rowed stroke in the Corpus eight.

After graduating in medicine Bridges served as house physician at Bart's, and later was appointed casualty physician there, finally becoming assistant physician to the Great Northern Hospital and to the Hospital for Sick Children, Great Ormond Street. During this period the future Poet Laureate contributed to *St. Bartholomew's Hospital Reports* a suggestive paper entitled "A severe case of rheumatic fever treated successfully by splints," and a valuable account of the casualty service of the Hospital, embodying many useful comments. Nearly fifty years later, long after he had ceased to be actively identified with practice, he turned again for a moment to a subject related to Medicine, when he collaborated with Dr. Cuthbert Morton in a tract on the language of anatomy, an attempt to reduce the then chaotic anatomical terminology to some sort of order.

Dr. Bridges gave up the practice of medicine in his thirty-seventh year, so long ago now that most have forgotten that he ever was a physician, not from any sense of having mistaken his calling, but probably owing to the gradual development within him of the sense of beauty and an urge towards literary expression, the seeds of which were sown in his student days at Oxford. No, Robert Bridges was not a failure as a physician. He took his profession seriously and gave promise of much distinction in it; he attained the coveted dignity of Fellowship in the Royal College of Physicians. But undoubtedly his title to fame will rest upon his gifts as a poet.

Bridges made his reputation by his "Shorter Poems," which appeared in slender instalments from 1873 to 1893. Quietly and unobtrusively his fame grew. At first appreciated only by the inner circle of the initiated, even when appointed

Poet Laureate in 1913 he was by no means generally known and accepted. Far from being the conventional Poet Laureate, writing odes to order on official occasions, Bridges yet remained somewhat aloof, so much so that on one occasion a member of the House of Commons asked that the Poet Laureate might be officially desired to earn his "butt of sack." But his genius soon found wider scope and his war poems and especially his "Spirit of Man" appeared, designed to bring calmness and fortitude to his fellow countrymen during the time of stress. Some of these poems were first published anonymously, notably, the spirited ballad "Der Tag," which appeared in *The Times*. The rare distinction of the Order of Merit came to him in 1929.

It is rather curious that Bridges' poetic genius, while it developed slowly, produced its finest flower in his old age. The lovely "Testament of Beauty" was published on his eighty-fifth birthday, and is likely to be one of the permanent possessions of English literature. In it a deep religious feeling is combined with the humanism of Medicine. Indeed, it may mark for posterity the end of an epoch, inasmuch as it is a personal synthesis of the whole spirit of an age, to the making of which have gone all the scientific, artistic, philosophic and religious attainments of a great nature.

Robert Bridges was a finished workman in the mere craft of his calling, but he was more than that, for he brought all the resources of a scientific temperament and a broad culture to the perfection of his artistry. Unlike some of his predecessors in office he was a fine scholar and a great poet. The medical profession may well honour their Poet Laureate.

A.G.N.

BENEVENUTUS GRASSUS OF JERUSALEM*

The profession in general and ophthalmologists in particular are under deep obligation to Dr. Casey Wood for this delightful translation of the ancient treatise on the eyes, their diseases, and the treatment of them, by Benevenutus Grassus of Jerusalem. Considering the age in which it was written, this work must be regarded as an excellent presentation of our knowledge at that period, and it was held in very high esteem by the profession for about five hundred years, during which it out-ranked all other works on this subject.

Of Benevenutus Grassus himself we have no certain facts except those he gives us in his own writings. Apparently he was born about

the beginning of the twelfth century in Jerusalem, of a family able to give their son what was in those days considered a good education. He became master of many languages, of which the more important were Hebrew, Arabic, Italian, and Provençal. His medical education he received at the school of Salerno, at that time the best in Europe. He tells us that after graduation he travelled much, and for the sake of his art visited both hot and cold countries. From his writings we learn that he practised in the Near East, in many cities in Sicily and Italy, and finally settled in Montpellier, France, where he established a reputation as a successful operator on the eye. Here he became connected with the medical school of that city, and taught students many of whom came from long distances, and whom in his lectures he frequently addresses as "*amici mei carissimi*". Here he apparently writes this treatise, which Dr. Casey Wood refers to as indispensable to a proper understanding of the history of ophthalmology and its progress from the tenth to the twentieth centuries. Judging from the Ferrara text as presented to us by Dr. Wood, Benevenutus taught with much self-assurance; his directions are given clearly, and although there are many repetitions of old dogmas there are also numerous original observations. Many of his instructions for operations on the eye might almost pass muster to-day. He never fails to call attention to the importance of attending to the general health of the patient, and his directions regarding diet are very conservative. As the reviewer in the *British Medical Journal* writes "it is a treat to find a mediæval textbook which refrains from prescribing the many forms of nastiness which abound in the prescriptions of that period."

As with all ancient codices and printed books very few copies of the Benevenutus text are in existence, although we know of about forty different ones, 22 manuscripts and 18 printed editions. The earliest that we now possess is the 13th century Provençal codex in the Library of the University of Basle. Of the Ferrara edition eight copies only are known to exist; one in England; four on the Continent, and three in America.

Perhaps the most interesting part of this incunabulum for the modern reader is the translator's preface which occupies the first 24 pages of the volume, in which he discusses the predecessors and successors of this Ferrara text, and afterwards gives an account of the life and professional career of this much travelled writer. Following the text of the purely medical portion of the volume Dr. Casey Wood presents us with a catalogue of the various codices and prints of the treatise by Benevenutus, and closes with a

* De Oculis, eorumque egritudinibus et curis. Translated with notes and illustrations from the first printed edition, Ferrara, 1474 A.D., by Casey A. Wood, M.D., LL.D. 23s. net. California: Stanford University Press; London: Milford, Oxford University Press. 1929.

bibliography of the references made in the translation. The book is printed on fine special paper with special type, and is enriched by numerous illustrations of the first and last pages of the Ferrara edition, of two pages from the Provençal

manuscript of the 13th century, and pages from the Old English Ashmolean codex in the Bodleian Library. The publishers deserve great credit for the beautiful format of the book.

A.D.B.

Special Articles

ON THE PRODUCTION OF A CONDITION OF PYREXIA IN MAN BY SHORT RADIO WAVES*

By A. D. BLACKADER, M.D., LL.D.,

Montreal

The value of heat as a means of alleviating and sometimes curing disease has been recognized in an uncertain way throughout the history of medicine. The significance of fever in relation to the course of infectious disease or to the healing of a bodily trauma has been frequently discussed and has generally been regarded as a symptom only. Nevertheless, evidence has been accumulating that pyrexia, provided that the temperature does not rise too high, may be a phenomenon with curative properties, and should be regarded not infrequently as a defensive mechanism of the body against a developing microbial invasion.

Many investigators have described methods for increasing temperature in the tissues of the body, locally or generally. To raise the body temperature of laboratory animals is comparatively simple. They are not able to eliminate increased body heat quickly and effectively. Their hairy coat is a protection, and they do not possess man's great area of sweat glands on an extensive peripheral vascular bed.

Local and superficial heating in man is easily accomplished, but, owing to his temperature regulating mechanism, any marked increase of body temperature is difficult to effect. Various physical methods have been tried; hot water baths, the exposure of the body to heated dry and moist atmospheres, and more recently diathermic methods have been employed. While those engaged in developing physical therapy have been conducting experiments the bacteriologists and immunologists have been studying the problem. They have found that the injection of a foreign protein, either as a diagnostic or a therapeutic agent, may so affect the heat centre as to result in a pyrexial condition with symptoms similar to those observed in an acute infectious disease. Quite recently it has been shown that the induction of an acute febrile

attack may result in the improvement of a chronic afebrile malady. Of this a well known instance occurs in von Jauregg's development of malarial infection in the treatment of neuroparetics. That the pyrexia associated with the course of the malarial infection is the curative agent is certainly suggested by the favourable results obtained from this treatment of neurosyphilis.

Previous physical methods of producing pyrexia in a patient have been difficult of application. The observations of Dr. W. R. Whitney, Director of the Research Laboratories of the General Electric Company, have revealed the fact that an elevation of the body temperature occurs in men working in the field of a short wave radio transmitter, and considerable experimental work has been undertaken to adapt this energy to the production of artificial fever. Special types of apparatus have been designed in the research laboratories of the Electric Company and have been tried experimentally in an endeavour to induce a rise of temperature in man rapidly, without discomfort, and to a degree high enough to be of value. The latest equipment has been constructed on the same principle as that of a short wave radio transmitter. The patient is suspended on interlaced cotton tapes stretched across a wooden frame; the under surface of the frame is covered with celotex, one-half inch thick, and a cover of the same material of similar thickness, eight inches high and a foot shorter than the frame, is fitted over it, so that the head of the patient projects through an opening at one end. The patient rests on his back and plates are placed at each side of the celotex box so that the waves can oscillate through the body from one side to the other. By this means the rectal temperature of the body has been raised to 104 or 105 degrees in from 60 to 80 minutes. Even higher temperatures may be obtained, but because of limited experience, caution has been observed. When the desired temperature is reached it may be maintained in several ways; either by decreasing the amount of voltage, by increasing the distance of the plates, or by maintaining beneath the covers a current of hot air. The temperature of the body recedes only slowly to normal if the patient is allowed to remain in the box, or if he is removed from the box and wrapped in heavy woollen blankets.

* Abstract of a paper appearing in *Science*, vol. lxxi, 1844, p. 450. Production of Fever in Man by Short Radio Waves, by Dr. Chas. M. Carpenter, and Dr. Albert I. Page.

Patients begin to show signs of hyperpnea at 104°, and these become more marked as the high temperature is prolonged. Occasionally nausea or headache is complained of. Systolic and diastolic blood pressure is increased. Nevertheless, generally speaking, the patients do not appear to show signs of much distress or fatigue even when the maximum temperature has been maintained for an hour and then allowed to return to normal. Their condition appears more satisfactory than after any of the other methods of inducing an artificial pyrexia.

It would appear that the development of heat is due to the resistance of the body to the induction of the current between the surfaces adjacent to the opposed plates. The heating of solutions similar to the blood serum is dependent directly upon their electrical resistance. It has been shown that dilute solutions of different salts, when of the same electrical resistance, exhibit practically identical heating effects. Doubtless, with more experience, improvement in the equipment will take place.

The use of pyrexia as a therapeutic agent is still in the experimental stage, but it would appear to have possibilities of effecting important therapeutic results. The use of the method demands conservation and sound judgment, but this method of inducing a temporary pyrexia would appear to have value not only for the clinician but also for the physiologist, the biochemist, and the bacteriologist. Two desirable effects are evidently obtained. The increased heat within the body appears to induce an environment unfavourable to the multiplication of a virus, and the rate of the chemical processes concerned with the development of immunity and with the general defence mechanisms of the body against infectious agents appears also to be stimulated.

GENERAL IMPRESSIONS OF A VISIT ABROAD

The following is an extract from a brief account by Dr. R. Marshall Allan, Professor of Obstetrics, University of Melbourne, of his impressions abroad (*Med. J. of Austral.* 482, April 12, 1930).

"In my limited time a few general impressions after a hurried visit to the main centres in Canada and the United States only can be attempted. The first feature which strikes the stranger is that practically all the hospitals are built and maintained by private funds and contributions. They seem to find no difficulty in persuading a wealthy man or a religious body to endow a hospital. The main object of such a backer is to meet the annual deficits from which even American hospitals built on a community plan are not immune. Once the financial

means have been secured, there seems to be no limit as regards plans and equipment. Most of the hospitals visited were distinguished for their spaciousness and luxurious equipment, not only for patients of all grades but also for the nurses' quarters. A particularly striking feature was the large entrance hall and waiting room furnished like the lounge of a first class hotel. Every attempt was made to get away from a cold hospital atmosphere. In many places different departments were united in the same building, the classic example being the huge medical centre in New York. On the other hand, several capable administrators preferred separate buildings for each unit, but all close together; Montreal and Cleveland were good examples of this. Compared with our standards the size of the hospital staffs was astonishing. Not only were doctors and nurses proportionally more numerous, but the administrative staff of typists and clerks seemed enormous. Probably as a result of the organizing frame of mind of the American all hospital activities were developed to the highest possible degree. This is especially seen in the keeping of records, the follow-up system, and the social service department. The records room of Johns Hopkins Hospital, for example, contained thirty-one clerks, while the Women's Hospital in New York kept five typists hard at work all day. One is astounded at the apparent efficiency of all this and also by what it must cost. However, one comes away with the feeling that here and there it was somewhat overdone and in fact several breakdowns were noted. Although it may not be quite so convenient for the medical staff, especially for those seeking statistical information, it is comforting to know that for those of us in less affluent circumstances the results as far as the patient is concerned can be attained in simpler ways.

The educational number of *The British Medical Journal* of last year contains an article by Sir Norman Walker on medical education in the United States which will repay reading. Owing to the premedical requirements the average age of the students is greater than with us, but the actual educational attainments of the general run of freshmen appears often to be below our standards. Latin is not compulsory, a knowledge of modern languages is frequently sketchy, while the general standard of English is low. This criticism does not apply to the leading schools, but to several others which were visited. Most schools restrict the numbers entering each year and the "chronic" is not tolerated.

The teaching of obstetrics in America affords a striking contrast to what occurs in Europe. On the Continent both obstetrics and gynaecology are united in one chair with the professor absolute head of the department. Conditions in Great Britain vary. In some instances the pro-

fessor is merely one of the staff of the teaching hospital and as actually happens at Glasgow may not even have continuous service throughout the year. In America only a few of the universities combine both subjects under one man, but these comprise the cream of the schools. Hospital accommodation is arranged accordingly. For example, in Montreal where the subjects are combined, there is a separate obstetric hospital connected by passages with the general hospital. In New York, on the other hand, at the medical centre these subjects form a special department under one man and occupy three floors of the building. At Chicago there is a large obstetric hospital, but gynaecology is mainly taught at separate institutions by other men. Johns Hopkins Hospital has separate departments in the same building, while at Cleveland and St. Louis, probably the best centres in the States, they are housed in adjacent buildings. In both of these schools, although gynaecology is taught by a separate professor, the professor of obstetrics is the head of the department. The tendency among the leaders of the profession is to regard any division as unnatural and to insist on the unity of the subject with obstetrics playing the predominant rôle.

The theoretical teaching of obstetrics is good, particular attention being paid to pathological demonstrations. Extensive use is made of moving pictures and each clinic has its own set of films dealing with details of operative procedure. While in Chicago I was able to hear the first "talkie" obstetric film presented by De Lee who illustrated his lower segment Cæsarean section operation under local anæsthesia.

In many centres the amount of practical work seemed inadequate. Often only six to twelve women were delivered by the student during his course. One must also recognize that completion of the academic course does not lead to immediate private practice and that owing to the requirements of the State licensing boards the majority of graduates proceed to a period of internship when opportunities of obtaining more practical work are available. At Johns Hopkins Hospital the idea seems to be that as many students will not practice obstetrics later, therefore, there was no need to teach the whole class in an intensive manner. For those who desired it there were optional or elective classes in the final year. There is, however, no guarantee that the graduate may not change his mind later and his only training may have been the course in the junior year when he lived in the hospital for one week and attended six women in labour.

The splendidly equipped wards for babies are a striking feature of all American hospitals. Visitors are never admitted and a separate staff cares for the infants and takes them to their mothers at feeding time. All attendants in the nurseries wear gowns and masks. The large

percentage of artificial and supplementary feeding was also very noticeable. I was not impressed by the universal custom of handing the infant over to the specialist in pædiatrics immediately after birth. I still think that the obstetrician should maintain control while the mother is in hospital, naturally seeking the co-operation of the pædiatrician when in difficulties.

Although in some centres, notably Montreal, New York and Baltimore, conservative methods are practised, I cannot but note with concern that surgical methods of delivery are more popular both with doctors and patients. Potter, of version fame, is a man of charming personality, slow and deliberate in his manipulations, but even in his hands the fetal mortality following this procedure for normal labour is not negligible; the use of a deep episiotomy and the application of forceps early in the second stage of labour by De Lee appear to yield good results. But the same cannot be said of the host of their imitators who do not possess their technical skill. Confidence in the powers of Nature is not a strong point in the armamentarium of the average American obstetrician.

A very high standard was observed in all the gynaecological clinics. I was struck by the quiet, deliberate methods of procedure and the care taken in pre-operative preparation, narcosis and the gentle handling of tissues. The cordial and friendly relationship of chief and assistants and the absence of noise and recrimination in the operating theatres were also noticeable.

Weekly or fortnightly staff meeting are a feature of all clinics. Some left the impression of careful staging after much preliminary work, but the great majority were most helpful and a valuable check on the current work of the department.

Americans do not like their poor showing regarding maternal mortality, and efforts to reduce this reveal many problems more difficult than those with which we have to contend. The coloured population, with its greater incidence of venereal disease and contracted pelvis, as well as an increased liability to sepsis and an aversion to antenatal supervision, tends to keep the average rate very high. The large proportion of eastern European immigrants present many problems before they are assimilated. Many of them have difficult deliveries due to pelvic deformities not met with in the Anglo-Saxon. The poor training of so many of the older practitioners and of the graduates of the low grade schools, coupled with the amount of operative delivery, presents another problem. However, the persistent work of the American College of Surgeons and of the leaders of the profession is gradually being felt. A strong committee appointed by President Hoover is quietly investigating and from conversations with the chair-

man I am convinced that they are working along the right lines. It is pleasing to know that the work already done in Australia and New Zealand has been noted with approval and envy.

One aspect of the problem relates to the quality of the nursing services. In America, although three months' training in obstetrics is part of the regular course of every nurse, she only observes patients in the labour ward and never delivers them. There are no trained obstetric nurses as we know them, except those who have been abroad for their course. This applies particularly to the Kentucky Frontier Nursing Service, analogous to our bush nurses, who send their nurses to Scotland for the course familiar to us all out here. B. P. Watson, of

New York, is taking this matter in hand and is leading a campaign in favour of such a change.

It is not easy to epitomize my impressions of America after a too short visit. While there are apparent unlimited resources of wealth and also a lavish expenditure on non-essentials, we must also remember the power of organization coupled with enthusiasm and high idealism which characterizes particularly the leaders of the profession. They fully realize many of the shortcomings and are determined to rectify them. I must also acknowledge with gratitude the friendliness and almost embarrassing hospitality accorded to me throughout Canada and the United States. One of the discoveries of the trip was how much we had in common, despite the attitude of a section of the press."

Men and Books

THE KING'S JESTER

The story of the King's jester who "got religion," became a pilgrim, and founded a hospital, is not unknown, for it has been told and retold. Eight hundred years ago Rahere established the Priory and Royal Hospital of St. Bartholomew. The former institution has passed away, but the latter still exists, the premier hospital of England, and exerts an influence for good that has grown with the ages. Bart's, to call it by the familiar and endearing name which is given to it by the Londoner, is known, it is safe to say, to medical men the world over. Now, it needs £1,000,000 and it will get it. Already, in accord with the plans for expansion, a great new Surgical Block containing 250 beds and an Operation Block of six theatres have gone up, which provide the most complete and modern provision for surgical work in the world. St. Bartholomew's Hospital was conceived in faith and, evidently, it still lives by faith. Close by, in the stately old Norman church of St. Bartholomew the Great, lie the remains of the pious founder, consecrating his noble foundation. It is difficult for us, living in a comparatively "new" country to appreciate all that is bound up in the story of St. Bartholomew's. We have, it is true, four hospitals in Canada of venerable antiquity—the Hôtel Dieu, of Quebec, founded in 1639; the Hôtel Dieu, of Montreal, founded in 1644; the Hôpital General, of Quebec, founded in 1693; and the Hôpital General of Montreal, founded in 1694; all of which antedate any similar institutions in North America, with the single exception of a hospital in the city of Mexico, founded by Cortez in 1524. But what is three hundred years compared with eight hundred! Yet, the Canadian medical profession,

it is certain, regards the further development of St. Bartholomew's with sympathetic interest.

The story of Rahere and his foundation are told so charmingly in a printed appeal put out recently by St. Bartholomew's that we have no hesitation in reprinting it. Perhaps, too, it may prove a stimulus to good works.—[Ed.]

"Just eight centuries ago, there was moving in the public life of London a simple priest called Rahere. His life work and his personality are immortalized by the Royal Hospital of St. Bartholomew which he founded under circumstances little short of miraculous. After all these hundreds of years it is equally wonderful that so much about this inspired Londoner, recorded in the annals of those early middle ages, has been preserved to us. And Rahere is the prototype of many to-day, streaming through the city's streets, actuated as he was by a love of God and of humanity, seeking how to serve these two deep devotions, and never being turned aside by discouragement or the thousand obstacles which lie between man's hopes and their fulfilment.

This mystic, whose bright life flashes from the tapestry of English history, came in the steps of William the Conqueror and was always a favourite with his son and successor, King Henry the First. There is no doubt that Rahere, whom the chronicler describes as 'a pleasant witted gentleman,' came of humble birth, and had raised himself to be the King's friend by his particular gifts of wit, resourcefulness and tenacity. He passed through many phases of success and from his early youth was marked as a man of brilliance.

Imagine the London of the eleven-twenties. The new dynasty was aglow with the noblest ideals. The Tower of London was the architect-

tural marvel of the day. The Conqueror's son and his court strove to turn the vanquished country into an Eden of civilization. They had brought from France their gay and elegant manners, their rich attire, their taste in art and learning, and their practical plans of commerce and architecture. And England was at peace. It was in this vital atmosphere of progress that Rahere's character developed. His young manhood was spent amid the vanities of King Henry's court. Of all the jesters, he was the most clever. He sang his ballads with the

the Priory of the Augustines and plunged into holy works with the same eagerness he had applied to his merry-making at court. As he grew in piety, he stripped himself of all earthly possessions and prepared for a pilgrimage to Rome. Clad in the plain brown cassock of a humble friar, this one-time glittering courtier bade farewell to the King and set forth on the arduous march across Europe.

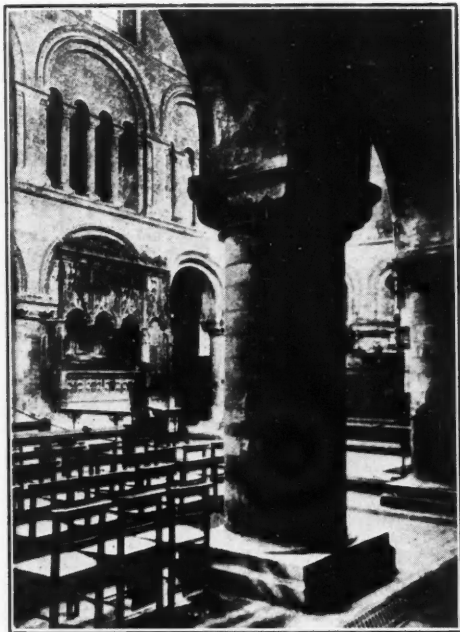
The pilgrimage shows the reality of his conversion and the sincerity of his repentance. The journey to Rome in the early Twelfth Century was toilsome and hazardous. There were few roads and population was sparse. The traveller suffered the risk of wolves, of marauding bands, and of robber barons more fierce and more rapacious than the beasts. The journey was one to daunt the stoutest or most pious heart, but danger and difficulty now meant little to Rahere. And yet to him the journey must have been doubly hard. The man who had been but lately the pampered favourite of a luxurious court would find little comfort on his way; and the dangers of the journey might well be magnified to an Englishman who lived in a land in that reign so well governed that 'a man might safely travel through the length and breadth thereof with his bosom full of gold.'

Once in the city of Saint Peter, the devout Rahere spent his days amid the relics of ancient and Christian Rome. He studied and he meditated, and found on the banks of the Tiber, in the Church of Bartholomew, which succeeded a former Temple of Aesculapius, his most inspiring shrine.

Rome was seething with an epidemic, and the pilgrim from London fell a victim to the plague. In his pain and delirium, he prayed to recover his health, for his new experiences had taught him much, and he was not willing to die. Turning to his Creator for help, Rahere made a vow that, if returned safe and well, he would build a hospital in London for the relief of the poor. The Merciful Lord heard his prayer and, says the chronicler, granted him 'the will to live.' Once restored to health, Rahere made ready to quit Rome and to 'return to his own people.'

Not questioning ways or means, Rahere began his tramp to England, burning with the one idea—to 'perform his vow.' It was on the journey that a vision came to the faithful man, and the chronicler tells of this dream 'full at once of terror and sweetness,' as it is written:—

After sweat by day he was refreshing his limbs by rest and it seemed to him that he was borne on high by a certain wild beast and set on a very high place; and bending down the glance of his eyes to the depths, he discovered a horrible pit beneath him, so deep that it baffled all human view. . . . and when, seized with fear. . . . he stood shuddering with horror, a great light was beside him—a vision of majesty and hope. 'I am Bartholomew, Apostle of Christ, and come to help thee in thy difficulty. I



Rahere's Tomb in the Church of St. Bartholomew the Great, London.

greatest gusto. His repartee was the most dazzling in all that merry throng of Twelfth Century London. But he saw for himself exactly how much value there was in flattery and indulgence and pomp and idleness.

And then came to Rahere a change of heart. Why? The chronicler relates: 'Because Merciful God converted this man from the error of youth and added to him many gifts of virtue, for they are often the lowly born of the world whom our Lord chooses to confound the mighty.'

At this time, King Henry's court was plunged into a sudden grief. The King's son William, the promising heir to the throne, was drowned in a shipwreck off the English coast. The ship, *Blanche Nef*, was lost with the Prince, his sister, and the flower of the Norman nobility. This catastrophe had a deep and sobering influence on the entire population and particularly on the sensitive Rahere. He became a lay brother in

have chosen a place in Smithfield where in my name, thou shalt found a church. Have faith and act manfully. Do thy part of servant and I will discharge the duty of master and patron.'

And Rahere resumed the journey: full of his double mission—the Hospital which he had vowed to set up and the Church he had been bidden to build. Smithfield was then a 'right unclean' marsh beside the New Gate and held small promise when the returned pilgrim beheld the scene of his foundation. Yet the holy Edward the Confessor had foretold that the place would be great before God and all people. Certain Greek pilgrims had prophesied that its fame should reach 'from the rising of the sun to the going down thereof.'

The land was Crown property; and, seeking the help of Richard de Beaumes, Bishop of London, Rahere petitioned the King for the use of this place for his good works. King Henry graciously agreed, and thereby became the first benefactor of St. Bartholomew's Hospital. Ten years later, in 1133, he granted Bart's its Foundation Charter which has been justly called the Magna Charta of Health.

Having obtained the title to the land, Rahere 'gladly set to work, omitting no care of diligence to carry out his double work of piety.' Under his inspiring leadership the men of London dug the foundations; at his direction the walls grew beneath their hands. The rich men and the poor, the very children, worked on his hospital out of love for him. His eloquence, his fire, his piety, called up the walls as though by miracle. His compassion for the sick, his devotion to the cause seemed to be built into the very walls of Bart's. After eight hundred years they are a part of the place, as though his quiet spirit still walked there, breathing new hope into its patients, and pity and sacrifice into its doctors and nurses.

'Whatever Thy hand findeth to do, do it with all Thy might,' is written over the medical school. Rahere might have carved it. It shows that the spirit in which Bart's was founded is the spirit in which Bart's lives.

Superb was the courage of this man, toiling day by day and turning the waste land into a great and glorious monument of charity. It was the courage of one whose belief in himself and in his fellow-men was a heaven-sent gift.

Rahere lived until his work was done and his Temple of Healing had become one of the glories of Norman England. He left a church and a hospital to his fellow-countrymen, and his memory was honoured by 'those who saw him, heard him, and were present at the work.'

'His proved purity of soul, cheerful bearing, with perfect honesty in divine service, and prudent management of temporal government, deserved great praise. Humble in prosperity, patient in adversity,

his life was given to helping the sufferings of wretched men and the necessities of the poor.'

For more than eight hundred years this hospital of the simple Londoner has endured—to ease suffering, to heal maladies, to advance medical science, to train doctors and nurses, and to serve humanity throughout the world. The vision of St. Bartholomew and the foundation of the hospital are the expression of an age in which Rahere lived, and the natural result of a vivid and poetic people.

The spirit of to-day has reverence for the glories of the past and Rahere's living helpers will not be called on to carry stones and fill a marsh, but, stirred by his memory, will contribute to the Great Reconstruction Fund and maintain the record of their ancestors."

LORD BALFOUR AND THE PROGRESS OF MEDICINE

Abstracted from an article in the British Medical Journal by Sir Walter Fletcher, K.B.E., C.B., F.R.S.*

No English statesman of modern times, with the possible exception of Lord Haldane, has ever had the same grasp as Lord Balfour of the methods by which natural knowledge is enlarged and more detailed information of the growing points in its chief branches. He had quite exceptional opportunities given to him by birth, by his political career, and by his almost unique position in society, of aiding any great cause he had at heart. His political life, party warfare, the irregular claims and opportunities for constructive legislation, and, nearer the end, the great tasks laid upon him during and after the war, all these kept him from giving with any continuity and completeness the service he was always eager to give to the progress of knowledge and to its more effective use for the general good. Nevertheless, in uncountable ways he used his powers at every opportunity to serve education and research, to deal a stroke for them at this point, to remove an impediment at that. Only as time passes can it be seen how great in sum has been his achievement within those fields.

The debt that medicine in particular owes to Lord Balfour is certainly hardly measurable now, but it may assuredly be said that no great statesman can be named in modern history as having done it greater service. The benefits we owe to him are both general and particular. In general, medicine has drawn increasing strength, like every other field of learning, from the services Lord Balfour gave to educa-

* *Brit. M. J.* 1: 660, April 5, 1930.

tion in the country as a whole. The national system of public secondary education, the soundness of which is the condition of strength for any national university system, was the work in great measure of Balfour, aided by that great public servant Sir Robert Morant.

Lord Balfour's specific services to the progress of medicine as such, and outside this general sphere of education, have been thrown into shadow, even more than his services to physical science, by the glamour of his personal and political gifts. His kinship with Lord Rayleigh kept him in easy touch with the growth of physical science that he followed with such personal interest, and he played a leading part in the foundation of the National Physical Laboratory during the Premiership of his uncle, Lord Salisbury. Many of his public utterances and writings, of which the brilliant address he gave as President of the British Association at Cambridge in 1904 is a good example, made the educated public well aware of his informed sympathy with the progress of physical science, and the fascination it had for him in its relation to philosophic thought. But he had an even closer family tie with the biological world. His brother Francis, for whom the chair of animal morphology was especially created at Cambridge, where the beauty of his short life and great work are still a living tradition, may be called the founder of comparative embryology. It was in tribute to Lord Balfour and his family, many years after his brother's untimely death in the Alps, that the Balfour chair of genetics at Cambridge, first held by Bateson, was endowed. He followed the progress of biology at all its chief points of active growth with at least the same eagerness and enjoyment as he drew from the developments of physical science. There was certainly no aspect of biology which had a stronger appeal for him than that of its bearing upon the hopes of human progress and upon the immediate merciful work of the medical profession. At every period of his life he showed his interest in the progress of medicine and the medical sciences.

During most of his life he had little time to give public service in this direction except by occasional speeches on behalf of institutions or societies. His speeches, however, had an educative value of exceptional kind. They were not the deliverances of the prominent public man giving patronage to science in a speech framed for him upon the occasion. They were speeches made *ex tempore* from the briefest possible notes, that showed personal knowledge of the essential problems in view and of the methods being used to solve them. A good example may be found in speeches made more than a quarter of a century ago on behalf of the Imperial Cancer Research

Fund. His knowledge and clear vision allowed him not only to understand the point of view of the scientific workers, but to explain it to the public at large and to the laymen whose support was necessary. Looking back now with our present knowledge, we can see that Lord Balfour was then taking the true vision and giving wise counsel, and not a word that he said in those early years appears now to be out of place or unjustified. So it was in his speeches on behalf of many other interests, whether upon tuberculosis during the early years of the century, when public attention was focused upon it, and sanatorium treatment was being actively developed, or upon eugenics, or upon bacteriology, that he had seen born as a science, or upon the importance of the study of tropical medicine for the Empire. Above all, and at every point, he threw his influence steadily into movements, whether public or private, that made towards the better encouragement of scientific research. He did much behind the scenes, and he spoke upon this matter publicly and often. Nowadays it is becoming not uncommon for public men to understand the value of research and to work for its aid. But thirty years ago or more there was no Minister of the Crown who would or could have said, as he did in 1898:

I have all my life been an ardent believer in a cause which is often laughed at—the cause of the endowment of research. In that cause I most firmly believe, and I think there is no branch of knowledge in which it may find a more useful field of application than in that of advancing medical knowledge. It is wonderful to think how the public are prepared to pay, and in my opinion rightly prepared to pay, for the services of those whose clinical genius, whose power of absorbing all that is practically useful in the knowledge of their day, whose bedside genius—if I may so describe it—demands, and ought to have the fullest recognition—it is wonderful, I say, how the public are prepared to pay for that kind of genius, but apparently put aside with indifference the not less essential kind of genius which deals with the progress of knowledge and the furtherance of invention. This is not selfishness; I think it is latent imagination. The work of the medical practitioner is seen at once; its value can be immediately appreciated; but he who spends his life in the pursuit of the secrets of Nature, working in his laboratory, may very often receive no public recognition at all during his life, except from that restricted circle of experts who alone, after all, are capable of forming any valuable estimate of its merits.

and four years later he said:

I do not believe any man who looks round the equipment of our universities, of our medical schools, and other places of education, can honestly say in his heart that we have done enough to equip research with all the costly armoury which research must have in these modern days. We lag behind—we, the richest country in the world, lag behind Germany, France, Switzerland, Italy. Is it not disgraceful? Are we too poor, or are we too stupid? Do we lack the imagination required to show what these apparently remote and abstract studies do for the happiness of mankind?

We must count it a very happy stroke of fate that brought him at the age of 71, after his long political life and his later services in making war and making peace, to be Lord President of the Privy Council, and in that office to be responsible to Parliament and in the Cabinet for the greater part of the State aid now given for the support of scientific research. It would not be hard to guess, and indeed I have heard him declare himself, that no part of all his public work, immense as its range had been, had brought him so much matter for personal interest or had seemed to him to be of more importance. In each of the two research Departments falling directly under him—the Department of Scientific and Industrial Research and the Medical Research Council—his active personal interest from that beginning, now ten years ago, is passing into legend. On the very day after he assumed office, a tall gentleman called unexpectedly at the not very obvious offices of the Medical Research Council in Buckingham Street and announced himself as Mr. Balfour. He had called, he said, to see “whether there was anything he could do to help.” The Council had worked previously under some six or seven Ministers, variously eminent, but none, I think, had ever made himself aware of the geographical position of the office. In like manner he paid, as Minister, repeated personal visits to the sister Department. Need explanation be offered for the affectionate devotion his courtesy and simplicity won from all his subordinates?

In 1922 he resigned with the Coalition Government and assumed private life. In 1924 Mr. Edward Wood, now Lord Irwin, resigned the chairmanship of the Medical Research Council on his appointment to be Viceroy of India. The appointment to the vacancy on the Council fell to Lord Curzon. He desired a representative of the Council to seek the opinion of Lord Balfour, who indicated that he himself would be willing to join the Council and become chairman, if Lord Curzon could not see his way to a better appointment. Never, we may suppose, was an appointment more confidently made, and never, certainly, was any so welcome to the Council he joined. From that time, and for nearly five years, until his health failed, he regularly attended meetings of the Council and gave the most ready sympathy and eager help to their work at all times and in every way open to him. Upon Lord Curzon's death in 1924 Lord Balfour joined Mr. Baldwin's Ministry and again became Lord President of the Council. As is now well known, he made the Medical Research Council aware that he so much en-

joyed seeing their work at first hand that, unless the point were raised by others, he was prepared himself to connive at a situation in which he remained chairman of a body that was advisory to himself as Minister to the Crown. He continued to serve the work of medical research in both capacities until the Ministry fell last summer, and he resigned his chairmanship of the Council on the ground of ill health shortly afterwards.

Lord Balfour's knowledge of the research work done on behalf of the two research organizations under him had made him increasingly aware before 1924 that some better machinery was needed for bringing the results of investigation, when attained, into more effective application in human affairs, and that this machinery must include more effective modes of consultation between separate administrative Departments or Services on the one hand and the men with first-hand scientific knowledge on the other. When Mr. Baldwin announced in Parliament after Lord Curzon's death that Lord Balfour was to succeed as Lord President, he said that he was to be entrusted with the special task of improving the machinery for bringing the results of scientific work into their proper relation to statecraft. Almost immediately after his appointment in 1924 Lord Balfour, who, as Prime Minister a quarter of a century before, had established the Committee of Imperial Defence, proceeded to set up a closely analogous machinery for civilian affairs as the Committee of Civil Research. Under this committee, as under its military counterpart, there sprang up progressively a number of subcommittees, each constituted with a single eye to the promotion of some special object. It is now increasingly apparent as the facts have become known that no single agency did more to save the country in the war than the timely work of the Committee of Imperial Defence. It is not a rash speculation to guess that the next generation will realize that no single agency may have done more to save and develop the Empire than Lord Balfour's Committee of Civil Research, re-christened by his present successors the Economic Advisory Council. If the records could lie open it would now be seen what effective work Lord Balfour had done at the extreme end of his long life for the advancement of science and for the enrichment of its powers to help the country. In no branch of science has this been more evident than in the biological sciences, and especially in those medical sciences serving the well-being of human life and industry in tropical parts of the Empire.

Association Notes

BRITISH AND CANADIAN MEDICAL ASSOCIATIONS

Winnipeg, August, 1930

TENTATIVE BUSINESS AND ENTERTAINMENT PROGRAM

Friday, August 22nd

- 9.00 a.m.—C.M.A. Council Meeting.
- 1.00 p.m.—President's Luncheon.
Ladies' Luncheon.
- 2.00 p.m.—Ladies' Bridge and Golf.
- 3.00 p.m.—C.M.A. Council Meeting.
- 4.00 p.m.—Annual Meeting, Canadian Medical Protective Association.
- 7.00 p.m.—Complimentary Dinner by Manitoba Medical Association.
- 8.30 p.m.—Ladies' Bridge.

Saturday, August 23rd

- 9.00 a.m.—C.M.A. Council Meeting.
- 1.00 p.m.—Luncheon.
- 2.30 p.m.—Recreation — Week-End Trips.
- 7.00 p.m.—Annual Dinner.

Monday, August 25th

- 9.00 a.m.—B.M.A. Registration at Winter Club.
C.M.A. Council Meeting.
- 1.00 p.m.—Annual Meetings of:
Alberta Medical Association
Saskatchewan Medical Association
Manitoba Medical Association.
- 4.00 p.m.—C.M.A. Ladies' Tea at Winter Club.

Tuesday, August 26th

- 9.00 a.m.—Registration at Winter Club.
President opens Exhibits.
- 10.00 a.m.—Ladies' Conducted Tours and Motor Drives.
- 10.30 a.m.—Address of Welcome.
Annual Meeting, British Medical Association.
- 3.00 p.m.—Robing (Law Courts).
Procession to Cenotaph.
Open Air Religious Service, Parliament Buildings.
- 5.00 p.m.—Ladies' Tea at Winter Club.
Lacrosse Match.
- 8.00 p.m.—Reception of Delegates, Winter Club.
- 8.15 p.m.—President's Address, Winter Club.
- 9.00 p.m.—President's Reception and Dance, Parliament Buildings.
- 10.30 p.m.—Alumni Suppers.

Wednesday, August 27th

- 10.00 a.m.—Meetings of Sections.
Ladies' Conducted Tours and Refreshments.
- 1.00 p.m.—Irish Graduates' Luncheon.
Ladies' Lunch at Agricultural College.

- 2.00 p.m.—Address: "Work, Rest and Play in Health and Disease," Sir Farquhar Buzzard, Bt., K.C.V.O., M.D., F.R.C.P., London.
- 4.00 p.m.—Pageant, Assiniboine Park.
- 8.00 p.m.—Ice Hockey and Fancy Skating Carnival.
- 10.00 p.m.—Reception and Dance, Royal Alexandra Hotel.

Thursday, August 28th

- 8.30 a.m.—National Temperance Breakfast.
- 10.00 a.m.—Meetings of Sections.
Ladies' Conducted Tours. Visit Garden Show. Tea at Southwood Golf Club.
- 1.00 p.m.—Ladies' Buffet Lunch. Luncheon St. Charles Country Club. Golf.
- 2.00 p.m.—Address: "The Primary Tumour in Carcinoma of the Breast," Sir Lenthal Cheate, K.C.B., C.V.O., C.B., F.R.C.S., and another address yet to be arranged.
- 3.00 p.m.—Conferment of Degrees.
- 4.00 p.m.—Garden Party.
- 7.00 p.m.—Annual Meeting.
- 8.30 p.m.—Public Meeting.
- 10.00 p.m.—Reception and Dance.

Friday, August 29th

- 8.30 a.m.—Medical Missionary Breakfast.
- 10.00 a.m.—Meetings of Sections.
Ladies' Conducted Tours. Visit Garden Show.
- 1.00 p.m.—Ladies' Luncheon, St. Charles Country Club. Golf.
- 2.00 p.m.—Address: "The Significance of Surgical Recoil following Visceral Decompression," Sir Wm. DeCourcy Wheeler, Kt., M.D., F.R.C.S., F.A.C.S., and another Address yet to be arranged.
- 3.30 p.m.—Racial Group Singing and Dancing, Lower Fort Garry.
- 9.00 p.m.—Listerian Oration, Lord Moyrihan, K.C.M.G., C.B., F.R.C.S.

ACCOMMODATION FOR PRIVATE FUNCTIONS

All space in Winnipeg hotels suitable for meetings, luncheons, dinners, etc., is under the control of the Reception Committee.

Requests for accommodation for meetings, private luncheons, dinners, alumni gatherings and the like should be made early to the Honorary Secretary, Reception Committee, 102 Medical Arts Building, Winnipeg.

Applications will be dealt with in the order in which they are received, and to avoid possible disappointment should be forwarded now.

Several bookings have already been made and the space available for such functions is limited.

ACADEMIC DRESS

Academic dress is to be worn at the Annual Religious Service, the Presidential Address and Reception, the conferring of University Honorary Degrees and the Listerian Oration. It will add much to the colour of the meeting.

While every effort is being made by the Winnipeg committee to secure as many gowns and caps as possible for hire, the supply will be very limited, and visitors are urged to bring academic dress with them if possible.

BILLETING

All requests for accommodation should be forwarded without delay to Dr. J. S. McInnes, Honorary Secretary, Hotels and Lodgings Committee, 102 Medical Arts Building, Winnipeg. Applications have been coming in since September, 1929, and all applications received have now been dealt with in order of their receipt. Future requests will receive attention as soon as received and the best accommodation available at the time will be allotted. Those intending to come should communicate as soon as possible with the Honorary Secretary, Hotels and Lodgings Committee, stating the names of all in the party and the ages and sex of members of the family accompanying them, together with their requirements of accommodation.

REGISTRATION

Membership in either the British Medical Association or the Canadian Medical Association is necessary before anyone resident in Canada can attend. Visitors from points outside Canada who are not members of the British or Canadian Medical Associations will pay a registration fee of \$5.00. Registration cards will be forwarded to all making reservations for hotel or other accommodation in advance. Those arranging to stay with friends while in Winnipeg should kindly advise the Honorary Secretary of the Hotels and Lodgings Committee, giving the name and address of their hosts. On receipt of this information a registration card will be immediately forwarded.

TRANSPORTATION

To secure reduction of half fare on return journey, remember to get standard railway certificate when purchasing your one way

transportation to Winnipeg. This certificate will be vouched on presentation at the office in the Winter Club Building, Winnipeg, the headquarters of the Meeting.

LEADERS IN BRITISH MEDICINE

ALEXANDER MURRAY STUART MACGREGOR,
O.B.E., M.D., D.P.H.

The President of the Section of Preventive Medicine is the Medical Officer of Health for Glasgow, Dr. Macgregor. He was educated at Glasgow and Cambridge, and before assuming his present position served in several hospitals in Glasgow. He is the author of *Immunity Phenomena in Cerebro-Spinal Meningitis*, *Serum Treatment of Cerebro-Spinal Meningitis*, *Studies in the Epidemiology of Phthisis and Features of Smallpox Outbreak in Glasgow, 1920*. He holds the rank of Brevet-Major, R.A.M.C. (T.).

PROF. STEVENSON LYLE CUMMINS, M.D., LL.D.,
D.T.M. AND H. (CANTAB.)

Professor Cummins, who is coming to Winnipeg as President of the Section on Tuberculosis, had a distinguished military career before becoming David Davies Professor of Tuberculosis, University College of South Wales, Cardiff.

Born in 1873, he entered the Army in 1897; became captain 1900; major 1909; Lt.-Col. 1915; Col. 1918; served in the Nile Expedition 1898 (medal with clasps; mentioned in despatches); in the Sudan 1900-1902; Sudan, 1904 (medal with clasp). He received the Order of Osmanieh, 4th class, in 1907; served in the European War, 1914-1918 (C.B., C.M.G.; mentioned in despatches six times; Bt. Col.); received the Legion of Honour (officier); Couronne de Belgique (officier); Croix de Guerre (Belgian), 1918.

Professor Cummins retired from the Army in 1921. Since that date he has been Director of Research to the King Edward VII Welsh National Memorial Association; is a Fellow of the Royal Society of Medicine. Among his important publications may be mentioned *The Role of the Typhoid Carrier*, *Primitive Tester and Tuberculosis*, *Influenza*, *Kala Azar*, and the sections on tuberculosis and tetanus in "The Official History of the War."

EVAN LAMING EVANS, C.B.E., M.A., M.D.,
CH.B. (CANTAB.), F.R.C.S. (ENG.)

Mr. Evans comes to us as President of the important Section of Orthopaedics. He is surgeon to the Royal National Orthopaedic Hospital; is a Fellow (and Past President of the Orthopaedic Section) of the Royal Society of Medicine. He served with distinction in the South African

War, receiving the Queen's Medal with three clasps. He has written numerous articles on his specialty, chief among which are: Astraglectomy, in the Robert Jones Birthday Book, The Treatment of Spastic Paraplegia by Posterior Root Section, and The late Results of the manipulative treatment of Congenital Dislocation of the Hip.

THE OSLER MEMORIAL

The Committee in charge of the Osler Memorial for the Canadian Medical Association again appeals to the members of the Profession in Canada to supplement the contributions already received.

In our last Annual Report, we emphasized the desirability of having each Local Medical Society throughout Canada take an earnest and active interest in the life and work of Osler. Suggestions were made regarding the holding of an Osler Day by each Society. We would now make this further suggestion:

Why cannot the Officers of these Societies initiate their interest by making a complete canvas of their members? We believe that if a real effort were exerted it could easily be possible to persuade every one of their members to contribute something, anywhere from two (2) dollars up toward our Osler Memorial Fund. Who will lead the way?

Certain County Societies have been more associated with Osler's life than any others in Canada.

In Ontario, Simcoe County should remember his birth place at Bond Head and the Barrie school days. Wentworth County, or the Hamilton Medical Society, has perhaps closer ties in view of the fact that he spent his early life in Dundas, where he produced his first scientific communication, "Christmas and the Microbes" and conducted other researches in "The Marsh". Here he first saw patients in practice. In the Hamilton City Hospital he relieved the Superintendent during a month's holiday.

York County and the Toronto Academy of Medicine can recall the days spent at Weston and in the Toronto Medical School, where he received the inspiration from Johnson and Bovell which played such an important part in building up his habits and character.

In Quebec we have a record of his activities at old McGill, with his many contacts and incidents too numerous to mention.

If any one of these Societies will begin at once with an active campaign, it may yet be possible to report their successful consummation of this plan before the time of the next Annual Meeting.

We would again ask every reader of the Journal, if he has not sent in his subscription, to do so without delay, and in addition to this

to use his personal influence within his own Society to carry out the program outlined above. Subscriptions may be sent to Dr. T. C. Routley, 184 College St., Toronto, or to Dr. J. Heurner Mullin, 201 James St. South, Hamilton.

THE HOSPITALS AND NURSING MISSIONS OF GREATER WINNIPEG

By ROSS MITCHELL, M.D.,

Winnipeg

ST. BONIFACE HOSPITAL

Two hospitals in Greater Winnipeg stand out with respect to age and size, the Winnipeg General Hospital and Hôpital St. Boniface, the former in the west end of Winnipeg, the latter on the east bank of the Red River, opposite the junction of the Red and Assiniboine. Hospitals were called into being after 1871, owing to the inrush of settlers following the purchase by Canada of Rupert's Land from the Hudson's Bay Company, and the coming of Lord Wolseley's expedition to quiet the disturbances incident to the change of government necessitated by the creation of the new province of Manitoba.

Even before that date there had been organized care of the sick. At midnight on June 30, 1844, four sisters of the Grey Nuns of Montreal arrived at St. Boniface in a bark canoe. Almost from the time of their arrival they entered upon their duties of teaching orphans, and caring for the sick. Their proper title is Les Soeurs de la Charité de l'Hôpital Général de Montréal, but from their costume they are commonly known as the Grey Nuns. In 1871 they had managed to acquire sufficient funds to build a hospital which would accommodate four patients. In 1877 they acquired a large house which could accommodate ten patients. The demand for beds increased so rapidly that ten years later the corner stone of the present hospital was laid. This first building was of brick, and measured 80 by 40 feet. In 1893 a transept, 140 by 50 feet, was added. St. Roch's Hospital for infectious diseases was established in the same year. A south wing, 223 by 36 feet, was erected in 1905. In 1917 the central part of the building was enlarged. It has a fine front of Tyndall stone, is six storeys in height and measures 167½ by 52 feet. In 1927 a residence for 14 internes was built. In 1928 a fine residence to accommodate 166 nurses was erected, and in 1929 a still further addition to the hospital was made. The hospital has 600 beds and is completely equipped. It is a teaching hospital of the University of Manitoba.

The Grey Nuns owe their origin to the

Venerable Marie-Marguerite Dufrost Lajemmerais (Madame d'Youville) and the Rev. Louis M. Normand du Faradon, one time Superior of the Seminary of St. Sulpice of Ville Marie, now Montreal. The order was founded in 1738, when the first city of Canada was little more than a village nestling on an island at the edge of a limitless wilderness.

This location was selected with a view to placing the institution in that portion of the city which would most centrally meet the needs of the future, and the site chosen proves the wisdom and forethought of those responsible for the conduct of the Winnipeg General Hospital in the early days. The building erected accommodated sixteen public ward patients and



Fig. 1.—St. Boniface Hospital

THE WINNIPEG GENERAL HOSPITAL

The Winnipeg General Hospital is junior to St. Boniface Hospital only by a short time. In 1871 a meeting was called by Lieutenant-Governor Archibald, and among those who attended were Hon. A. G. B. Bannatyne, Hon. Alfred Boyd, and Dr. J. H. O'Donnell. At this meeting a Board of Health was formed and steps taken to begin hospital work immediately. On December 13, 1872, the Winnipeg General Hospital was organized, but it was not until May 14, 1875, that Provincial Letters of Incorporation were taken out, a step rendered necessary by an appeal to the Provincial Government for assistance.

The first building occupied by the Hospital was situated on the north-west corner of McDermot and Albert Street, and was occupied only two or three months when the Hospital was moved to a house somewhere in the rear of the present Bank of Montreal, and afterwards to one on Notre Dame Avenue, owned by the late Dr. Schultz. From there it was moved to the bank of the Red River at a point south of Broadway on the present location of the Canadian National Railway. In 1875 the Hospital was removed to Main Street north to property owned by the late Hon. John Norquay. The sixth move was to a home owned by the Hospital between Bannatyne and McDermot, close to the present location on land donated by the late A. G. B. Bannatyne.

four private patients, and had a small operating room.

With the beginning of the Canadian Pacific Railway construction the large influx of settlers soon made the need for much greater accommodation apparent, and while arrangements were being made to collect funds for extensions the Hospital was moved to the Dominion Government Immigration Hall on Point Douglas Common. It was decided that the lot that had been donated to the Institution by the late A. G. B. Bannatyne and A. McDermot was not large enough, and this was exchanged for a block to the west of Olivia Street, and the adjoining block was purchased from the executors of the McDermot Estate for \$5,000.00. On this a building costing \$65,000 was erected and formally opened in 1884. The preponderance of males among the patients (10 to 1) showed that Winnipeg was still a pioneer city.

A Nurses' Home and Maternity Department were added in 1888, and the Isolation Hospital was built in 1892. The growth of the city soon made further accommodation absolutely necessary, and in 1897 arrangements were made for the erection of a surgical wing, which was opened in 1889, and in 1904 a wing was erected at the east end of the Medical Building and the administration portion remodelled.

In 1906 Bannatyne Avenue in front of the Hospital was diverted to form a crescent so as to increase the site of the hospital and the vacant square to the north was converted into a

park which provides a pleasant recreational area for convalescent patients.

The full tide of immigration into the west, between 1910 and 1912, was reflected in the expansion of the General Hospital at that time. New buildings, shown in the illustration, and providing accommodation for 250 beds, were completed in 1913.

Edward Hospital, Winnipeg, for advanced cases, to which reference is made elsewhere—has been directed from the Manitoba Sanatorium at Ninette, 160 miles west of Winnipeg. In 1929 it was decided that, since nearly half of the population of the province lies within a radius of ten miles of the Winnipeg City Hall, a Central Registry and Diagnostic Clinic should



Fig. 2.—Winnipeg General Hospital

The Winnipeg General Hospital was the first Canadian hospital to organize a social service department. This was in 1910. In 1919 a psychopathic ward was opened, and in 1922 an additional nurses' home. The first graduating class of nurses wrote their examinations in 1889. Since that time over 1,100 nurses have been graduated from the hospital training school. The Medical College, which houses the Medical Faculty of the University of Manitoba, lies immediately to the west, and is connected with the hospital buildings by an underground passage. The General Hospital is practically the University hospital, and more than 850 graduates in medicine have passed through its halls. These largely provide the medical service for western Canada. The hospital has accommodation for 700 beds. There is a large private service open to the patients of any reputable physician or surgeon in the community, and a public service under the care of the honorary attending staff, numbering thirty-two. The outpatient department is very large, and an honorary staff of forty-five doctors minister to their ills.

THE TUBERCULOSIS CENTRAL REGISTRY AND CLINIC

Up to the present the fight against tuberculosis in Manitoba—with the exception of King

Edward Hospital, Winnipeg, for advanced cases, to which reference is made elsewhere—has been directed from the Manitoba Sanatorium at Ninette, 160 miles west of Winnipeg. In 1929 it was decided that, since nearly half of the population of the province lies within a radius of ten miles of the Winnipeg City Hall, a Central Registry and Diagnostic Clinic should

MISERICORDIA HOSPITAL

Third in point of size among the hospitals of Winnipeg is the Misericordia Hospital. It is under the direction of The Institute of the Sisters "de Miséricorde" which was founded in Montreal, May 1, 1845, and canonically approved on January 16, 1848. The objects of the Institute are to help in the moral rehabilitation of the unfortunate victims of a deceitful world, and to receive, nurse, and bring up the poor forlorn children. Its motto is "Misericordia derelictis."

In 1898 a House of the Institute was established in Manitoba. Four sisters were brought out. Shortly after their arrival they bought land on Broadway, where they intended to lay the foundation of a permanent establishment. Unforeseen circumstances compelled them to abandon that site, and a new site was secured at the foot of Sherbrooke Street, close to Maryland

Bridge over the Assiniboine. In 1900 the first part of the present structure was completed.

In 1907 the hospital was enlarged and in 1912 the Asile Ritchot was built at St. Norbert, to give shelter to 100 babies. In 1916, a training school for nurses was established, and the hospital, which at first received only obstetrical cases, became a general hospital. In 1927, a large fireproof addition, fronting on Wolseley Avenue, was built. It contains splendidly equipped operating rooms and laboratories, as well as wards which bring the total capacity of the hospital to 225 beds.

THE CHILDREN'S HOSPITAL

In 1906 the idea of starting a hospital exclusively for children was brought before the Local Council of Women. A committee of four was chosen with power to add to their number. It was decided to open a hospital for children in a locality where the death rate was highest, and, until the venture had shown its value, to solicit no funds, but to raise them by their own personal efforts and the efforts of their friends. By running a tea-shop, by bazaars, literary teas, selling paper violets on the streets and in other ways these women finally secured sufficient funds to enable them to rent a large house. On February 6, 1909, the hospital was opened with one baby patient, one superintendent, one maid of all work, and a full staff of honorary physicians and surgeons. In that year 282 children were admitted, and 546 new patients treated.

With the need of a hospital for the exclusive treatment of children established, a site of $3\frac{1}{2}$ acres was procured on Aberdeen Avenue, overlooking the Red River. The present hospital was erected and was opened for patients in November, 1911. It was formally opened in July, 1912, by H.R.H. the Duke of Connaught, and he and his consort became Patrons of the hospital.

In 1916 a complete laundry unit was built and in 1918 a nurses' residence. In 1925 the Shriners' Hospital for Crippled Children established a unit for treatment of twenty patients by using one ward of the hospital. In 1928 by an addition, accommodation was provided for 32. At the present time the hospital can accommodate 133 patients. The outpatient department is splendidly equipped with quartz lamps and other apparatus for phototherapy supplied by the Kiwanis Service Club.

THE BUREAU OF CHILD HYGIENE

Adjoining the Children's Hospital is the Milk Dispensary owned by the City of Winnipeg and under the direction of the Bureau of Child Hygiene, a division of the Health Department. In 1912, the year prior to the institution of the Bureau of Child Hygiene, the death rate of

infants under one year was 207 per 1,000 live births. In 1928 the infant death rate was 63. The Bureau has three distinct services: the babies' clinic, a milk dispensary, and visiting nurses. In the milk dispensary are prepared by trained dietitians the modified feedings prescribed by the clinic, Children's Hospital and private physicians. The clinic is open daily, except Sundays, from 9 a.m. to 5 p.m. for consultations, advice and the weighing of babies. The nurses number fourteen; thirteen district nurses and one in attendance at the clinic.

GRACE HOSPITAL

Grace Hospital was organized in 1904 by the Salvation Army, in order to care for unfortunate girls, and to provide accommodation for maternity patients. It was incorporated in the same year by special act of the Manitoba Legislature and for a time work was carried on in a rented house on Young Street. In 1905 the corner stone of the first section of the hospital at the corner of Preston and Arlington streets was laid by Hon. R. P. Roblin, Premier of the province. In 1911 the hospital was considerably enlarged, and in 1927 a fully modern building, of fireproof construction, four storeys in height, and fronting on Arlington Street, was opened by Lady Willingdon, wife of the Governor-General of Canada. The three lower floors contain wards and nurseries, while on the fourth floor are waiting rooms, labour rooms and operating rooms with the latest equipment. With this addition Grace Hospital now contains 140 beds for patients, and also accommodation for 60 girls, as rescue work among the unfortunate has always been part of the work of the Salvation Army.

VICTORIA HOSPITAL

Victoria Hospital, on River Avenue in Fort Rouge, was built in 1912 by the late Dr. Thomas Beath. A few years before, Dr. Beath had built and operated a hospital on Bannatyne Avenue near the Winnipeg General Hospital. This structure, a wooden building, was later used for a short time by the City of Winnipeg as a hospital for infectious diseases.

Victoria Hospital is seven storeys in height, of reinforced concrete and brick construction, and has accommodation for 103 adult patients and 18 babies in the five floors used for hospital purposes. The Nurses' Home, a solid brick building, adjoins the hospital, while across River Avenue is the Annex, a brick-veneered building. This provides quarters for the Social Service home and for hospital attendants. The hospital is general and accepts all cases which are not contagious or infectious. It is an "open" hospital, in which any registered physician in good standing may attend his cases.

Dr. Beath was managing director until 1919 when he resigned on account of ill health. The present direction of the hospital is vested in a Board of Directors with Dr. J. R. Thomson as managing director.

ST. JOSEPH'S HOSPITAL

St. Joseph's Hospital, Winnipeg, conducted by the Sisters of St. Joseph, is situated on the corner of Salter Street and Pritchard Avenue, North Winnipeg, built in 1918, and operated as a private hospital until June, 1923, when it was taken over by the Sisters of St. Joseph, of Toronto, and immediately converted into a general hospital of fifty beds. In September of the same year a training school for nurses was opened.

In January, 1927, a new unit containing operating rooms, private and ward accommodation was opened, and a staff of attending doctors was formed for the departments of surgery, medicine, gynaecology, obstetrics, and eye, ear, nose and throat. A radiologist and pathologist have since been appointed. In the same year an out-patient department was opened.

The training school for nurses is under the direct supervision of the Sisters of St. Joseph, and is affiliated with the King George and King Edward Hospitals for Communicable Diseases.

The Order of the Sisters of St. Joseph was established at LePuy, France, October 15, 1650, by Mgr. Henri de Maupas, Bishop of LePuy. In 1836 the first American foundation was made from the Community at Lyons, France, and on October 7, 1851, the first Canadian foundation was made at Toronto, Ontario.

The special purpose of the Congregation of the Sisters of St. Joseph is the instruction and Christian education of youth and the direction of charitable works such as orphanages, hospitals, and homes for the poor and aged.

THE MUNICIPAL HOSPITALS

The Municipal Hospitals, comprising King George Hospital for acute communicable diseases, King Edward Hospital for advanced pulmonary tuberculosis, the Smallpox Annex, Nurses' Home, Power House and Superintendent's Residence, are grouped in the south end of the city in a 25 acre park, triangular in shape, with the Red River forming the base of the triangle. King George Hospital has 200 beds; King Edward Hospital 100 beds; and the Smallpox Annex 30 beds.

Hospital service as a civic utility dates back to January, 1911, when the old Beath Hospital on Bannatyne Avenue near the General Hospital was purchased to provide for the cases of scarlet fever prevalent at that time. Five months later a temporary building for cases of advanced pul-

monary tuberculosis was opened. This building was located on the site in the Riverview district mentioned in the previous paragraph. In July, 1912, King Edward Memorial Hospital was ready for occupancy, and in February, 1914, King George Hospital was opened.

H.R.H. the Duke of Connaught opened the King Edward Memorial Hospital and laid the foundation stone of the King George Hospital on July 11, 1912.

Sixteen training schools in Manitoba, Saskatchewan, and Ontario send their student nurses to the Municipal Hospitals of Winnipeg for training in infectious diseases nursing. Medical students from the University of Manitoba also receive instruction here.

The high standard reached by Winnipeg hospitals may be judged by the fact that all the hospitals come in the fully approved list of hospitals drawn up by the American College of Surgeons.

DEER LODGE MILITARY HOSPITAL

Fronting on Portage Avenue, and looking to the Assiniboine River, stands the hospital for ex-service men. Deer Lodge hostelry was for many years a favourite resort of Winnipeggers, but during the war it was taken over by a citizens' committee as a convalescent hospital for returned men. In 1917 the Department of Militia took it over and used it as an Officers' Hospital. Later it came under the Department of Pensions and National Health. In 1927 and 1929 fireproof wings were added to the original wooden structure. The total bed accommodation is 204 and the hospital is completely equipped with operating rooms and x-ray apparatus.

MOUNT CARMEL CLINIC

Mount Carmel Clinic is the most recent of Winnipeg's institutions for ministering to the sick. Located in a fine brick building on the west bank of the Red River it is well situated to serve the adjacent thickly settled district. The clinic is maintained by voluntary contributions and renders aid to the sick poor without distinction of race, creed, or nationality. It contains the latest equipment for diagnosis and treatment.

WINNIPEG HEALTH DEPARTMENT

Winnipeg has reason to be proud of its health department, which for a number of years has been under the direction of Dr. A. J. Douglas. As late as twenty-five years ago typhoid fever was prevalent and swelled the death rates. From 1904 onward energetic steps were taken to stamp out the disease with the result that for the last ten years very few cases have developed within the city. The steps taken included an extensive campaign of education as to the means whereby the disease is trans-

mitted, insistence upon sewer connections, the abolition of outdoor privies, and the building of an aqueduct ninety-six and a half miles in length to bring a supply of purest water from Shoal Lake, an arm of the Lake of the Woods. The fight against other communicable diseases has been waged with equal vigour. Reference is made elsewhere to the Municipal Hospitals which provide accommodation for sufferers from diphtheria, scarlet fever, tuberculosis, smallpox, and other communicable diseases. The Bureau of Child Hygiene, mentioned earlier, comes under the survey of the Health Department. The death rate for the City of Winnipeg for the year 1927 was 8.29 per 1,000 population, and not the least among the factors which keep the death rate at a low figure is the Health Department.

THE VICTORIAN ORDER OF NURSES

The Winnipeg Branch of the Victorian Order of Nurses, an organization which extends across Canada, is particularly strong and efficient. It has existed in Winnipeg for twenty-nine years and has grown with the community. The staff consists of a supervisor and twelve nurses. The Order also has a list of women who can act as helpers in the home when the mother is ill. The nursing service of the Victorian Order is divided into two classes—district and hourly. In district nursing the fees charged for visits are on a sliding scale according to the patient's ability to pay, though the size of the fee does not regulate the service. One of the objects of the Order is to foster a spirit of independence and self-respect among its patients. In hourly nursing a fixed rate per hour is charged. This service is run on a self-supporting basis, and is in no way a charity. In times past the Winnipeg Branch has also done industrial nursing, *i.e.*, assuming the nursing care of the employees of large departmental stores and other organizations.

NONCARCINOGENIC NATURE OF PURIFIED MINERAL OILS.—The wide publicity given in recent years to the production of cancer in human beings by contact with lubricating oils has caused considerable concern as to the possible dangers of using the heavy oils for therapeutic purposes. This apprehension is of course the result of complete lack of knowledge of the exact conditions under which such oil cancer appeared. Therefore, while several investigations have been made of the carcinogenic possibilities of specially purified oils, a study on a large scale of some widely used therapeutic products was considered advisable. The following experiments were therefore undertaken: Samples of Squibb's Liquid Petrolatum (Californian) and Nujol sold by the Standard Oil Company of New Jersey were obtained from a reliable druggist. A race of mice was employed which was known to be susceptible to cancer by painting tar on the skin. Four hundred of these mice were taken and divided into two groups. Each was fed the regular laboratory diet consisting of bread, fresh vegetables and some grain meal. In a second series of experiments 100

While at the present this work is not being carried on the Winnipeg Branch is prepared to resume it when conditions warrant.

In addition to the district work the Victorian Order carries on an educational campaign, through prenatal and postnatal visits, a "Well Baby" clinic in St. James, and Home Nursing and Mothercraft classes.

The Victorian Order Dental Clinic is a boon to those who cannot afford to pay the full charges of a dentist. Some fifty dentists of the city generously give their services free to this clinic.

The headquarters of the Winnipeg Branch are in the Medical Arts Building, itself a splendid monument of medical enterprise and co-operation.

THE MARGARET SCOTT NURSING MISSION

This mission is called "The Margaret Scott Nursing Mission of Winnipeg" in acknowledgment of the unselfish and self-sacrificing labours of Mrs. Scott in ministering for many years to the physical and spiritual needs of the sick poor of this city. It is supported by a society formed to perpetuate the work of Mrs. Scott who, happily, is still living, though in delicate health.

The Mission was organized a little over twenty-five years ago. The Nurses' Home is at 99 George Street in the east end of the city, close to the Red River. The Mission is denominational and ministers to the sick poor without making any charge. In 1928 the visits made numbered 27,864, of which a large proportion were to female patients as maternity nursing forms a large part of the work. The nurses are usually twelve in number, including six student nurses from the Winnipeg General Hospital and two student nurses from the Children's Hospital who come to the Mission for two months' experience in district nursing.

mice were fed with one drop of Nujol and 100 with one drop of Squibb's Liquid Petrolatum (Californian), three times a week. This amount is about one four-hundredth of the body weight, or equivalent to 6 ounces (180 c.c.) of the oil every other day to a person of average weight. In another set of experiments, 600 albino rats were treated. They were given the stock laboratory diet and three times a week two drops of liquid petrolatum was fed. The oil was placed in the pharynx of the animal by means of a medicine dropper. This was about one six-hundredth of the body weight, or 4 ounces (120 c.c.) of oil to a human being weighing 150 pounds (68 Kg.). The results of these experiments lead Francis Carter Wood to conclude that painting the skin of albino mice with mineral oils of a type used therapeutically does not cause cancer. Painting the skin of mice of the same strain with heavy lubricating oil produced a few papillomas. Painting with tar produced numerous papillomas and a considerable percentage of carcinomas. Feeding mice of the same strain with medicinal oil did not produce cancer of the gastrointestinal tract.—*J. Am. M. Ass.* 94: May 24, 1930.

Hospital Service Department Notes

A SURVEY OF THE CATHOLIC HOSPITALS OF THE UNITED STATES AND CANADA

The March, 1930, number of *Hospital Progress*, the official magazine of the Catholic Hospital Association, was devoted to the report of a very interesting survey of the Catholic Hospitals of the United States and Canada. The last directory of the Catholic hospitals was published in 1918 and the various details of the two summaries have been closely compared. It is of interest to note that in the twelve year period there has been a 32.5 per cent increase in the number of the Catholic hospitals in Canada, the number rising from 101 to 134. A comparison of the bed capacities is also quite interesting, as there has been a 105 per cent increase since 1912, the total capacity in Canada rising from 10,999 to 22,622 beds. Catholic hospitals represent 15 per cent of all hospitals in Canada and 74 per cent of all hospitals controlled by religious organizations. Their hospital accommodation, exclusive of basinettes, is 26.5 per cent of all of the hospital accommodation in Canada and is almost 84 per cent of the accommodation in all hospitals under denominational direction.

The average capacity of all Canadian hospitals in Canada is 86.7. The average capacity of the Catholic hospitals in Canada is 145.6 beds, which is close to the average bed capacity of the Catholic hospitals of the United States, namely, 149.9. The largest hospital in Canada is stated to be the St. Jean de Dieu Hospital, at Gamelin, Quebec, with a bed capacity of 4,000. It is interesting that this report comments on the lack of provision in Canada for convalescent patients.

In commenting on the question of the oldest Catholic hospital on the continent, the report states:—

“As far as Canada and the United States are concerned, the data here available definitely point to 1637 as the date of the oldest hospital still extant, and that hospital, as we have already mentioned—L'Hôtel Dieu du Précieux Sang, Quebec. (Three institutions were founded between 1600 and 1650—the first of these, the L'Hôtel Dieu du Précieux Sang, Quebec, 1637; the Hôtel Dieu de St. Joseph, Montreal, 1642; and the other, General Hospital, Quebec, founded 1693.) It is also interesting to note that it is listed among the hospitals still in operation.”*

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, Secretary, 184 College Street, Toronto.

The compilers of this survey had some difficulty in classifying the hospitals according to religious orders. The Sisters of Providence seem to control twenty hospitals. The Grey Nuns would seem to control 33 hospitals, but it is obvious that this designation applies to at least three different orders. The Sisters of St. Joseph control 23 institutions, but it is not clear whether the Sisters of St. Joseph of Peace are included in this group. The Sisters of Charity control 17 hospitals. Altogether 29 different orders are mentioned in the replies. Slightly more than one-third of all the Catholic hospitals, namely 35.8 per cent, have been approved by the American College of Surgeons.

In Canada 74, or 55.2 per cent, of the Catholic hospitals have schools of nursing. In the United States 66.9 per cent of the Catholic hospitals are conducting schools of nursing. The Catholic hospitals have 34 per cent of all the schools of nursing in Canada. They have 45 per cent of all the student nurses and their average attendance is 47.6, compared with an average attendance of 36.9 in all schools of nursing in Canada. The entrance requirement of the Catholic schools of nursing as compared between Canada and the United States indicates a higher entrance requirement in the United States. In the United States 54.1 per cent of the Catholic hospitals require four years of high school training, whereas none in Canada requires four years. In the United States 56.4 per cent of the training schools in Catholic hospitals require more than two years high school, whereas, in Canada, 5.4 per cent require more than two years high school. These figures cannot be accepted too literally, because 37 per cent of the training schools in Canadian Catholic hospitals did not reply, whereas all but 6.8 per cent replied in the United States. As the percentages were struck by comparison with the total number of Catholic training schools rather than with the answers received, the percentages for Canada appear much lower than in reality. The great majority of Catholic hospitals in Canada require two years of high school training. Moreover, the high school equivalents may not be parallel in the two countries.

* There are several errors in this statement. Only two hospitals were founded in Canada between 1608 and 1650, the Hotel Dieu of Quebec, in 1639, and the Hotel Dieu, of Montreal, in 1644.

In speaking of these old foundations one should not forget the Hôpital General, of Montreal, established in 1694 and the Hotel Dieu of Three Rivers, in 1697.—[Ed.]

Comparing Canada and the United States, the report reads in part:—

"To one unacquainted with the Canadian situation the number of Catholic hospitals in that country is a distinct surprise. We have already called attention to the fact that the limit of hospital influence, as measured by the number of persons of the population affected, is distinctly more intense for Canada than it is for the United States. Proportionately, there are three times as many hospitals (Catholic) in Canada as there are in the United States, if this is measured by the total population of the country. While, on the one hand, we have a greater frequency of smaller hospitals with both the advantages and disadvantages implied, we also find in Canada some of the outstanding larger hospitals on the continent. The preponderating share, almost 90 per cent, which the Catholic hospitals have of the total bed capacity under religious administration, is another one of the features which is distinctly impressive. Finally, the same phenomenon which obtrudes itself upon one's notice in the statistics for the United States is emphasized in the Canadian situation, the fact, namely, that the percentage of hospital beds is uniformly larger than would be expected on the basis of the percentage of the hospitals, evidencing a tendency on the part of the Catholic sisterhoods to form larger institutions than exist in the non-Catholic group."

The survey which is quite exhaustive contains much valuable data, and is a decided acquisition to our own records. The compilation of this report by Father A. M. Schwitalla, S.J., and Mr. M. R. Kneiff has meant a great deal of work and the report should be of great interest to all hospital workers. Some of the comparisons made in the tables submitted may be open to question, as it is very difficult to compare this group of hospitals with an average bed capacity of 145.6 with the total list of hospitals in Canada, which includes hundreds of very small private hospitals, outposts, municipal hospitals, and other institutions of from two to twenty-five beds. The Catholic hospitals in Canada and the United States have been pioneers in the hospital care of the sick, have saved untold thousands of lives, and have done more than their share in furthering hospital progress and development.

THE PERSONNEL PROBLEM IN THE SMALLER HOSPITAL

The small hospital has many difficulties which are peculiar to the smaller institution and become less acute (to be replaced by others) as the hospital grows in size. One such problem is that of distributing the diverse duties and responsibilities among the limited personnel and extracting therefrom the most efficient and most economical service. Until the staff can attain sufficient size to permit extensive departmentalization, it devolves upon the majority of the salaried staff to be more or less jacks-of-all-trades,—and good ones at that, too.

One feels considerable sympathy for the nurs-

ing superintendent who must be a veritable "Pooh Bah" herself. Not only must she manage the hospital, conduct the training school, be responsible for the nursing and other service, do the purchasing and often keep the books, but she must constantly placate irritable patients and their still more restive relatives, be tactfully equable to all of the medical family, and act as the buffer between the various groups interested in hospital welfare.

This subject of distributing the work was discussed in a recent issue of *The Modern Hospital* by Mr. Ralph Hueston, of Silver Cross Hospital, Joliet, Illinois. He suggests that, where the school of nursing and the graduate staff are small, the duties of assistant superintendent, educational director, and operating room supervisor be combined in the one person.

The number of men employed in the service department of the smaller hospital is usually quite limited and it is recommended that every man employed in this department should be able to assume temporarily the duties of the other men. The chief engineer, the night fireman, the painter, the laundry supervisor, the gardener and the orderly should have an opportunity of learning enough of the other men's work, especially in the boiler room, that, in case of emergency, one could take on another's duties. This arrangement would be of considerable value on the half days off during the holiday season, or if, say, the chief engineer be called to some part of the building to effect repairs and someone else must be left in charge of the boilers.

One bookkeeper, with assistance from the clerical force, can do all the bookkeeping in the average small hospital. Inasmuch as many hospitals maintain a full twenty-four hours' service at the switchboard, an arrangement whereby the night operators can do a certain amount of the routine office recording and filing is of considerable help in the clerical arrangements. A collector, if one be employed, may be utilized in his or her spare time as an assistant to the bookkeeper, or the arrangement might be reversed. The bookkeeper may also be the stenographer and records librarian. Sometimes a nurse may write the patients' histories, if internes are not available, and if it is not possible to effect the much more logical and satisfactory arrangement of having histories written by the attending physician.

Laboratory services are much more difficult to maintain in smaller hospitals. Small hospitals may find it expedient to have one technician serve both pathological and radiological laboratories. A less frequent, but nevertheless a meritorious combination, is that of pharmacist and clinical laboratory technician. A pathologist or radiologist may be shared with a clinic group or building or with

a commercial laboratory. The writer might also have considered the plan of a group of hospitals engaging a radiologist who would divide his time between them; this is now done

successfully in parts of Canada. A travelling dietitian might be employed on a similar basis, an arrangement which would improve the food service in each hospital and at a minimum cost.

Medical Societies

THE REGINA AND DISTRICT MEDICAL SOCIETY

Dr. H. H. Mitchell addressed the May meeting of the Regina and District Medical Society on "The doctor and the law". He said that in cases of serious accident, whether any person connected with the accident is culpable or not, it is the duty of the medical man to see that the police or other authorities are informed; that in coroner's work the doctor should be ready and willing to assist in determining the cause of death; that it is the duty of the expert witness to give opinions and draw deductions from the facts, whether observed by himself or others; he should be prepared to criticize and to be criticized. The medical expert should try to prevent conflicting and bewildering medical evidence being given in court. Gross injustices are done when medical evidence is conflicting. There should be joint consultation between medical witnesses to prevent contradiction. The ideal is one medical witness of undoubted ability and integrity who places his opinion before the court for the guidance of the judge and jury.

Professional secrecy is not recognized by the law in Saskatchewan, but is recognized by the law in Quebec. No action for slander can be based on evidence given in court.

No duly qualified physician of Saskatchewan shall be liable to any action for neglect or malpractice by reason of professional services unless action is started within a year. It must be shown that he exhibited gross negligence; to make the defendant liable it is not enough that some medical man of far greater experience or ability might have used a greater degree of skill or care.

A surgeon is not held responsible for the acts of nurses in an institution, or of a graduate nurse on a private case, unless he was close at hand and was in a position to see and did not interfere. If, however, he fails to write his orders, he becomes a co-defendant and will be called upon to disprove his guilt.

A medical practitioner is not held responsible

for the acts of his assistants if his assistants are qualified and registered, but he is responsible for an assistant's acts at an operation where the assistant is actually helping with the operation. The surgeon is not responsible for the acts of an anæsthetist if such anæsthetist is registered.

A practitioner is not responsible for the acts of internes, qualified or not, and whether receiving fees or not, when caring for a patient in the hospital, unless the interne is acting under the doctor's orders. In other cases the hospital management assumes the responsibility. Hospitals are not responsible for errors or negligence of visiting physicians while practising in the hospital.

If a doctor operates on a patient and is given a free hand to remove all diseased parts and endeavour to return the patient to health he is not liable. If the surgeon, after being explicitly instructed not to do more than indicated, does so, he is liable. In dealing with a patient of that nature it is necessary to have all in writing or to have a witness.

Examination for disease under protest and resistance leaves the physician open to liability.

If a master calls a doctor to attend his servant, or even ratifies a servant's act, he is liable for the fee.

THE NORTH-WEST MEDICAL ASSOCIATION

The North-West Medical Association met on May 6 at North Battleford, when the following officers were elected: *President*, Dr. Moran; *Vice-president*, Dr. Jardine; *Sec.-Treasurer*, Dr. J. H. Jackson; *Executive*, Drs. A. O. Rose, H. Hurlburt, and L. A. C. Panton. Dr. R. G. Ferguson, of the Anti-Tuberculosis League, addressed the meeting. It was decided that a clinic be held every two weeks and cases referred by practitioners be examined for tuberculosis by a chest specialist sent by the League.

LILLIAN A. CHASE

University Notes

University of Toronto

The Lister day oration which is now given annually at the University of Toronto on the Balfour foundation was delivered this year by Dr. J. M. T. Finney, of Johns Hopkins Hospital, Baltimore. Dr. Finney took as his title "The making of a surgeon", and those of the large audience who were present listened to an address which they should ever remember. It was apparently the wish of Dr. Finney that the student should not get the idea that the mere technical training in surgery was the most necessary part of his career.

Touching first on the life of Osler, Dr. Finney showed how much this great student of medicine had meant to the medical world at large, not only from his knowledge of medicine but also from his ever having been a lover of men and mankind, and that throughout the life of Osler it was the friendships he had formed and the many tasks he had undertaken for the good and help of others which seemed to have meant most in his career. As regards Lister, Dr. Finney wished his hearers to realise that here again the great kindness of the man was one of his chief claims to a world's recognition. Next to this, no doubt, his insistent pursuit of the truth and his demand for accuracy and perfection in all of his experiments were always to be remembered.

Few lectures have been listened to with greater attention, and it was realised that in the person of Dr. Finney the audience saw a man who lived up to his precepts.

N. B. GWYN

A luncheon was given at the York Club on Saturday, April 5th, following the Balfour lecture, by Dean Primrose and Professor R. B. Thomson, of the Royal Canadian Institute, the guests of honour being Dr. Finney of Johns Hopkins University, Baltimore, Md., and Professor Arthur Thomson, University of Aberdeen, Aberdeen, Scotland.

The Charles Mickle Fellowship has been awarded to Dr. W. E. Gallie, professor of surgery at the University of Toronto. The fellowship, which is the income from an endowment of \$25,000 bequeathed by the late Dr. W. J. Mickle, is awarded annually to the member of the medical profession, who is considered by

the Council of the Faculty of Medicine to have done most, during the preceding ten years, to advance practical knowledge in medical art or science.

Edinburgh University

The program of post-graduate courses to be held at Edinburgh during the summer of 1930, in connection with the University and the School of Medicine of the Royal Colleges, has now been issued. A course on obstetrics, gynaecology, and diseases of children will be held from July 14 to August 9th; it includes clinical midwifery and clinical gynaecology, obstetrical and gynaecological anatomy, physiology and pathology, diseases of children, child welfare, and ante-natal clinics. The fee for this course is ten guineas. A general practitioners' course will be held from August 11th to September 6th. This course will extend over four weeks, for which a fee of ten guineas is charged; the first or second fortnight may be taken separately at a fee of six guineas. It includes instruction in applied anatomy, clinical medicine, infectious diseases, clinical surgery, and clinics on gynaecology, diseases of children, diseases of the eye, diseases of the ear, nose and throat, and dermatology. There will also be afternoon classes on bacteriological diagnosis, morbid anatomy, radiology, ultra-violet ray therapy, etc. Concurrently with the latter a general surgical course will be given at similar fees. This course will include applied anatomy, general surgery, special instruction upon the diagnosis of renal disease, abdominal surgery and attendance upon surgical operations, surgical clinics, demonstrations of surgical pathology, radiology, and similar subjects. Special classes for small numbers will be held upon such subjects as the pathology of the nervous system, vaccine therapy, medical chemistry, diseases of the blood, x-ray physics, etc. Attention is also drawn in the program to some extended courses which are held during the summer, autumn, and spring terms, upon diseases of the throat and nose, ophthalmology, venereal diseases, surgical pathology, and clinical medicine and clinical surgery. Application for enrolment in the various classes should be made to the secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

One of the problems to be solved by the Scottish Board of Health is the question of hospital treatment in the more southerly of the Outer Isles—North and South Uist, Benbecula and Barra; an area with a population of somewhat more than ten thousand persons. A committee of the Highlands and Islands Council for Hospital Services has been formed and will shortly make a report. North and South Uist and Benbecula are only separated from one another by the sea at high water. Between these three islands lie the celebrated fords. This is a region of extraordinary beauty, but so much out of the beaten track as to be seldom visited by strangers. The North Ford is a stretch of five miles of sand, and the South Ford is about a mile across. Frequently during the winter months the fords are impassable, as the western winds pile up the sea at the opening to the Atlantic so that it cannot recede. Passage across the North Ford is always a matter of interest and frequently of danger, requiring an intimate knowledge of tides, channels and quick-sands. The one safe way across the sands is indicated by a series of cairns, erected by a former practitioner, Dr. Alexander Macleod, of Kilpheadar, better known as *An Dotair Ban* or the fair haired doctor. Dr. Macleod's fame extended far beyond the islands on which he practised. In 1829, Lord Macdonald of the Isles was so impressed by his capability and knowledge of conditions in the islands that he appointed him his chamberlain. He subsequently took over the medical practice in the south of Skye and in Knoydart on the mainland opposite. Visiting a shepherd's wife in Knoydart in 1854, he fell over a cliff in the dark and was killed. The present proposal is that the existing cottage hospital at Daliburgh in South Uist should be enlarged, while a small hospital is likely to be erected in North Uist. In Barra it is suggested that the needs of the people will be served by the hospital at Daliburgh and by enlarging the present provision for midwifery cases in the nurses' house at Castlebay.

The foundation of the Astley-Ainslie Institute is an important development in the institutional treatment of the sick and injured in connection with the Infirmary. This is the subject of an interesting article in the *University of Edinburgh Journal*, by Mr. Alexander Miles, F.R.C.S. This institution provides a means of continuing the treatment of patients whose disability involves a prolonged convalescence. It has been specially designed for this purpose, and

is almost certainly the first institution of its kind to be so established. In connection with the Infirmary there is already a Convalescent Home at Corstorphine, which provides for the needs of those patients who require merely a short period of after-treatment. Patients suffering from "incurable" conditions, and from debility from old age are not eligible for admission. The Astley-Ainslie Institute is designed to deal with patients suffering from curable conditions who have passed the crisis of their illnesses, and who may be expected to regain normal health and be fit for their ordinary vocations. No limit is laid down for the stay of patients, provided that they are continuing to improve and that their recovery is likely to be complete and permanent. It is hoped that by relieving pressure in the wards of the Royal Infirmary that "waiting" cases will be admitted earlier, and dealt with before serious consequences have had time to ensue. The Ainslie Trustees have purchased some thirty-one acres of land in the Grange district, with a southern exposure facing the Blackford, Braid and Pentland Hills. This site has medical and historic associations. It forms part of the Boroughmuir, where in the reign of King James IV the Scottish host mustered before marching south to the tragic field of Flodden. On the Boroughmuir stood the ancient chapel of St. Roque, resorted to for intercession by the victims of the plague which visited Edinburgh several times during the sixteenth century. The property of Millbank which is included within the grounds of the institution was formerly the home of James Syme, called by Miles in "The Edinburgh School of Surgery before Lister" "The Napoleon of Surgery." In the drawing-room of Millbank, Joseph Lister was married to Syme's daughter Agnes, in 1856. The new pavilions for the reception of patients have been erected on the ridge of the hill facing south. They are built on the "butterfly" plan and are provided with verandahs on three sides, so that the patients may remain in the open in all states of the wind and weather. A scientific department has been erected. It comprises a research laboratory, radiographic and radio-therapeutic installations, a gymnasium for remedial exercises, a dental room, a dispensary and other offices. The present plans provide for the accommodation of one hundred patients with a staff of forty-two.

Under the auspices of the James Mackenzie Institute for Clinical Research at St. Andrews, Dr. John Hay, the Professor of Medicine at Liverpool University, delivered the first James Mackenzie Memorial Lecture, in the Council

Chamber of St. Andrews on Tuesday, April 8th. The lecture was entitled "Sir James Mackenzie and his Message." Professor Hay ranks Sir James as one of the master minds in the medicine of our times, and as one of the strongest personalities in this generation of British medicine. He considers that in the future he will find his place with such men as Sydenham, Stokes, Graves, Addison and Bright. Sir James Mackenzie is the finest example in our time of a general practitioner who, by force of character and exceptional mentality, rose from the ranks of the profession to become an outstanding authority with a reputation that was world-wide. After practising at Burnley, Mackenzie went to London at the age of 54. In 1918, he said "Farewell" to Harley Street and, at the age of 65 began a new phase of activity in St. Andrews. There he founded the Sir James Mackenzie Institute for clinical research. He believed in the intensive study of the patient at the bedside, and he held that the future progress of medicine depended largely on those who will study the symptomatology of the early phases of disease. It was this belief that in the end led to his dramatic decision to give up his lucrative consulting and hospital practice in London and start the Institute in St. Andrews.

The Senatus Academicus of the University of Edinburgh has resolved to offer the honorary degree of Doctor of Laws to the following:—

Sir Thomas Barlow, Bart., K.C.V.O., Physician-Extraordinary to His Majesty the King, Consulting Physician to University College Hospital, London.

Sir Otto John Beit, Bart., K.C.M.G., F.R.S., Director of the British South Africa Company; Founder of the Beit Memorial Fellowship for Medical Research.

Sir David Wallace, K.B.E., C.M.G., F.R.C.S., Consulting Surgeon to the Royal Infirmary.

Karl Frederik Wenckebach, Emeritus ordinary Professor of Medicine, University of Vienna; Hon. F.R.C.P. (Lond.)

One of the pioneers of x-ray work in Scotland has died recently in Edinburgh. Dr. John W. L. Spence studied under the late Dr. Wilhelm Röntgen in the early days of his investigations, as far back as 1897. He was associated with the late Dr. Dawson Turner in founding the Radiological Department of the Royal Infirmary, and until lately was in charge of the x-ray departments of the Sick Children's Hospital, the Deaconess Hospital and Leith Hospital. Like so many of the first workers, Dr. Spence was exposed to dangers against which the radiologist of to-day is efficiently protected, and had to pay in suffering for the devoted service of those early days. Despite the loss of an arm several years ago, Dr. Spence continued his duties both in private and in hospital. Recently he underwent a further operation, in which

he lost the greater part of his remaining hand. In 1922, Dr. Spence was awarded by the Carnegie Hero Fund Trustees, a bronze medalion and an annuity for his services in x-ray work.

GEORGE GIBSON

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The London Letter

(From our own correspondent)

The news announced by the Minister of Health early last month of the establishment of a British Post-Graduate Hospital and Medical School in London in the near future is easily the most significant event affecting the profession as a whole since the War. Ever since 1926, when the first Minister of Health, Dr. Addison, set up a committee to study post-graduate medical work in London, some such result has been awaited. The problems have been most difficult to solve but it is believed that the nucleus provided by the Hammersmith Hospital of 400 beds, transferred to the London County Council's charge on April 1st under the new Local Government Act, will serve the necessary purpose and a medical school is to be built by Government aid. The University of London is to be encouraged (and it will no doubt agree) to recognize the new school and a residential hostel is to be established on a site in central London. The financial provisions appear to be quite satisfactory, and so far as present information goes, as summarized here, the scheme seems excellent. There is, however, a surprising absence of information on the vital question of how the teaching is to be organized. The visiting post-graduate from abroad, no less than the general practitioner on a "refresher course," will rightly demand the best and the leading members of the profession can scarcely take on extra duties at the new centre without dropping some of their present work. If junior men, with more time on their hands, are to be appointed to take charge of the patients, while seniors motor down for lectures which could be equally well given in any other lecture-room the present position will not be greatly improved. The appointment of a good Dean and the announcement of the scheme for teaching are the next steps and they are eagerly awaited. Meanwhile a post-graduate school is really promised.

If the announcement about the post-graduate school is, as mentioned above, the most significant event affecting the profession since the war then the British Medical Association's scheme for a general medical service for the nation, published last week, is the most far-reaching proposal for the future. Mention has already been made in these notes not only of the steady progress of the state towards the complete manage-

ment of the health services of the nation but also of proposals put out from time to time for some sort of public medical service. It is because the state has passed definitely into the stage where it contemplates making complete provision for the medical care of the community that the profession has necessarily to move with public opinion and put up such schemes as are consistent with the best in the customs and traditions of the doctors of these islands. The British Medical Association's scheme set out in a supplement to the *British Medical Journal*, which may well become a classical document, is a logical development of the National Health Insurance service. Already, by the proposed "Maternity Service Scheme" and the "Hospital Policy," the Association has mapped out part of the extensions for the future. The present proposals include "the provision of a family doctor or general medical practitioner for everybody, together with such aid as may be required in the way of consultant, nursing, and other ancillary services." The financial basis of the scheme is an extension of compulsory health insurance for all except institutional services. These latter are worked out along the lines of the Association's Hospital Policy and include the provision of what is termed a "home hospital" where the family doctor would remain in charge. The scheme starts off with the fundamental principle "that a satisfactory system of medical service must be devoted to the prevention of disease no less than to the relief of individual sufferers". Educated public

opinion will welcome this and indeed the suggestions inherent in the provisional scheme are as much for the public to consider as anything else. In effect, here is what representatives of the profession think about the future of medical practice; the public, and the electorate more especially, have something to talk about.

Every two years measles comes to this country as a certain means of death for thousands of children among the poorer classes and ranks easily first on the list of the acute lethal specific infections of young children. The permanent damage done by lung disease in those that recover is also a serious feature. The business of prevention seems very difficult, despite the encouraging results reported by the use of convalescent measles serum. Recently several workers have published statistical studies and epidemiologists have learnt a great deal about the spread of the disease. Now, in the height of an epidemic, it is cheering to hear from an expert, even without isolating the virus, it ought to be possible to devise a simple method of partial and temporary protection, lasting longer than the passing immunity of convalescent serum. The object of this brief note is merely to set on record that such a method is urgently needed in a big town like London and if this should catch the eye of some bacteriologist eager for a name in history then here is a glorious opportunity.

ALAN MONCRIEFF

1 Queen Anne St., London, W.1.

Letters to the Editor

Registration for Canadian Medical War Veterans

To the Editor:

For a number of years I have felt that it would be a graceful act for the Dominion Medical Council to amend the council act so as to grant Dominion-wide registration to all physicians who had served in the Canadian Army Medical Corps in an actual theatre of war, such as France. As you know, the Act became effective in 1912, and provided that anyone who had been in practice ten years prior to 1912 could become registered at once in any province. The Act also specified that if one were licensed in Canada before 1912, one could become registered in any province after the completion of ten years' practice; those who acquired a license after 1912 were left out of the picture.

I was an employee of the Government of Canada for two years after the war. I was stationed with the department of S.C.R. at Winnipeg, and during this time I was in a good

position to observe what the Government was trying to do for many classes of ex-veterans. The Canadian Government certainly went the limit in its plans to re-establish the ex-soldiers of Canada. The Soldiers' Settlement Board took care of a great many; the Vocational and Training Branch took care of a good many more. Various employment agencies throughout the country co-operated in every possible way with the department in the placement and re-establishment of the ex-soldiers. I have kept in close touch with this kind of work ever since the close of the war and I want to pay my tribute to the generous action of the Dominion Government towards its ex-veterans. However, there is one comparatively small class of ex-veterans that was overlooked. I refer to the Canadian Medical veterans. I am well acquainted with a number of Canadian doctors who served in the C.A.M.C. These men suffered the loss of their practices while overseas, and a good many of them came back from the front disabled either from sickness of one kind or another or from

wounds. Some of them were compelled to seek warmer climates following the war. If they had been allowed to register without examination in some of the warmer climates of Canada, it would not have been necessary for them to move somewhere else or to give up practice altogether to enter some other kind of work which did not involve outdoor visitation in the severe winter climate in most parts of Canada. It seems to me rather unfair that these men could not be granted the privileges of Dominion-wide registration.

I am not desirous of stirring up any controversy, but I would like to stimulate an expression of opinion in your columns from those Canadian doctors who graduated and were licensed after 1912, and particularly from those who served in the Canadian Army in an actual theatre of war.

Very sincerely yours,

WM. COLE, M.D.

Long Beach, Cal., U.S.A.

May 7, 1930.

Topics of Current Interest

Is Carbon Monoxide a Tissue Poison?

While the principal action of carbon monoxide is undoubtedly to displace oxygen from the hæmoglobin molecule and cause asphyxia of the tissues, opinion differs as to some of its other effects upon the body cells. Some believe that the production of tissue asphyxia as a result of anoxæmia is its sole action in the body and that in every other respect it is a harmless and physiologically indifferent gas. They believe that all of its clinical manifestations, both primary and secondary—even coma, which is prolonged for days after all carbon monoxide has been removed from the blood—can be explained upon the basis of original damage done by oxygen privation at the time the individual was breathing the carbon monoxide gas.

In support of this view is an experiment by Haggard, in which he exposed pieces of the living and developing brain of a chick to an atmosphere containing 79 per cent carbon monoxide and 21 per cent oxygen, and found that they developed quite as well as his "controls" which were exposed to an atmosphere containing 79 per cent nitrogen in the place of the carbon monoxide and the same 21 per cent oxygen. This is particularly significant, since the amount of carbon monoxide which was used was from 100 to 200 times as strong as would kill a chick by combining with its hæmoglobin.

Further experiments have shown that flies and other insects which have no red matter in their blood are entirely immune to carbon monoxide. Haldane showed in 1895 that cockroaches could live for long periods in an atmosphere containing 80 per cent carbon monoxide and 20 per cent oxygen.

Opponents of this theory believe that carbon monoxide, in addition to causing tissue asphyxia due to anoxæmia, has a direct toxic action, particularly upon nerve cells. Warburg, as a result of his experiments with yeast and coccus in 1926, concluded that carbon monoxide combines with

a catalyst in the cells with which oxygen must combine before it can oxidize other substances, and that this catalyst is probably an iron-containing compound analogous to hæmoglobin. Haldane the following year published the results of his experiments with moths, cress seeds, and rats. He found that in an atmosphere containing 80 per cent carbon monoxide the moth appears to require 7 to 8 times as much oxygen to maintain the same degree of activity as when the oxygen is diluted with nitrogen instead of carbon monoxide. Cress seeds require for their maintenance about two and one-half times as much oxygen under similar conditions. His experiments with rats showed that "a carbon monoxide sensitive substance exists in the mammalian brain as well as in the muscles where Keilin found it. Presumably it is of the same nature as the muscle catalyst and hence as that in invertebrates and plants. If so, carbon monoxide, like cyanide, stimulates the respiratory centres by inhibiting oxidation there. The possibility that they are made sensitive to oxygen by a substance like hæmoglobin, which changes its properties with the partial pressure of oxygen, is rendered very unlikely." He concludes further that since rats living on oxygen dissolved in their blood, in the presence of a sufficient amount of carbon monoxide to combine with almost all their hæmoglobin, are killed by the addition of more carbon monoxide, this must have some specific effect upon some substance in their tissues. He believes therefore that cells contain one or more catalysts of oxidation which are poisoned by carbon monoxide. The affinities of these catalysts of oxidation for carbon monoxide appear to differ in different species and perhaps in different tissues in the body.

Considering the question from still another angle, Glaister argues that since in cases of carbon monoxide poisoning the respiratory centres do not respond in the usual manner to the lack of oxygen in the body—that is to say,

by a marked hyperpnœa (increased rate and depth of breathing) associated with air hunger in other conditions of oxygen privation—that it is a proper inference that carbon monoxide has a peculiar specific action on the nerve centres and the nerve cells. This same question is emphasized by Hayhurst who discusses it as follows:

“If carbon monoxide poisoning simulates the gradual withdrawal of oxygen from the blood from the tenuity of the atmosphere as one ascends to great heights in aviation or in mountain climbing, as is claimed by most authorities, how do we explain the fact that in acute cases of poisoning, such as occur after a few minutes’ exposure in a closed garage, or a few hours’ exposure to the fumes of a maladjusted gas heating stove, nervous symptoms such as weakness of the knees, faintness, or loss of consciousness, invariably occur before respiratory symptoms such as shortness of breath, rapid breathing, cyanosis, and similar phenomena usually associated with asphyxia or air hunger?”

An attempt was made to throw still further light on this question and to determine the effect of carbon monoxide exposure upon organisms which can live only in the absence of air, (*i.e.*, in the complete absence of oxygen). These are known as anaerobic bacteria. The effect of carbon monoxide upon such organisms is of especial interest because in their case the question of oxygen utilization is eliminated entirely, and any injurious effect which might be produced by exposure to carbon monoxide would not, therefore, bear any relation to a deprivation of oxygen, but would be due to direct injurious action by the gas upon the body cells. The absence of such an injurious action of the gas would demonstrate that in the case of such an organism, at any rate, carbon monoxide is not a poison *per se*. For this reason the following experiment was performed:

The bacillus *Welchii* (a non-spore-forming variety) was chosen as the anaerobic organism for the test. Two blood agar plates were seeded. One was left in the room over night. The other was opened and exposed to pure carbon monoxide gas for about 5 minutes. After this it was closed and left overnight in a sealed container filled with carbon monoxide gas. Two sterile blood agar plates were similarly exposed and left in the carbon monoxide container. Next morning the seeded plates showed no visible growth, whereas the controls grown, in an ordinary anaerobic jar showed good growth.

However, transplants were made from the carbon monoxide plates on fresh blood agar plates. Also, the sterile plates which had been exposed to carbon monoxide were seeded. All of the plates were then placed into an anaerobic jar. After 24 hours all showed good growth. The carbon monoxide therefore apparently re-

tarded the growth of the organisms but did not kill them. Carbon monoxide gas cannot therefore be regarded as a cell poison for these particular organisms.

It is worthy of note, however, that potassium cyanide, which is a well-known tissue poison, in the case of organisms or animals who require oxygen to live, apparently is also not injurious to the so-called anaerobic organisms used in the present experiment. Somehow, the action of potassium cyanide, just like that of carbon monoxide, would appear to be dependent upon its combination with the oxygen receptors of the blood. In the case of carbon monoxide, it has been shown that the oxygen receptor in the blood of man is his hæmoglobin.

The experiment therefore shows that carbon monoxide is certainly not a universal cell poison, but this experiment does not prove beyond any question that the only action of carbon monoxide on these organisms is its anoxæmic one; it retarded their growth to the same degree that oxygen ordinarily would retard their growth (oxygen being a poison for them) even though it did not kill them.

The recent work of Stadie has thrown still another light upon the controversy. In considering the various theories of the action of carbon monoxide upon the body, the perplexing question is frequently raised as to why the symptoms of carbon monoxide poisoning are initially dizziness and fainting, whereas the initial symptom of other types of anoxæmia, such as those due to reduced barometric pressure, such as severe hæmorrhage, is primarily hyperpnœa or air-hunger. This is explained by him to a certain extent as due to a profound depression of the oxygen dissociation curve. This author argues that if the entire action of carbon monoxide were in reducing the availability of the hæmoglobin as an oxygen carrier by combining with it, then the effect should be the same as that resulting from loss of blood, as, for example, following hæmorrhage or as in severe secondary anæmia.

Thus a patient whose blood is 60 per cent saturated with carbon monoxide should theoretically be in the same condition as a patient with secondary anæmia, having only 40 per cent of the normal hæmoglobin. Actually, however, the carbon monoxide victim is worse off for the following reason. In his alveolar air, the ratio of carbon monoxide to oxygen is as 60/40 ($\text{CO/O} = 60/40$). That is, the partial pressure of the oxygen is only 40 per cent of its usual amount. This means that its speed in diffusing through the capillaries is only 40 per cent normal. Thus only 40 per cent of the patient's hæmoglobin is carrying oxygen, and that oxygen has only 40 per cent of its usual “push”, so to speak. His tissues are therefore in the same position as if he had 40 per cent of 40 per cent,

or 16 per cent of his normal hæmoglobin. He is, therefore, only 40 per cent as well off as the patient with secondary anæmia and a hæmoglobin of 40 per cent.

In brief, Stadie advances the theory as the result of animal experimentation, that the primary effect of carbon monoxide inhalation is its profound alteration of the normal oxygen dissociation curve, rather than the mere loss of functioning hæmoglobin. This alteration, he believes, is caused by the fact that, due to the presence of carbon monoxide in the alveolar air, the partial pressure of oxygen there is markedly reduced so that the same volume of oxygen carried in the capillaries would still not be equally available to the tissues.

Stadie has also brought out the interesting point that, due to the acid-base relation between carbon monoxide hæmoglobin and oxy-hæmoglobin, the rate of elimination of carbon monoxide from the blood stream is increased by any agent which would tend to increase the acidity within the cell. This, he believes, incidentally, to be one of the beneficial effects of carbon dioxide inhalation in cases of carbon monoxide asphyxia. The same increased elimination of carbon monoxide was obtained by him in his experiments by the administration of hydrochloric acid by mouth.

The question of the entire cause for the profound and the prolonged nervous manifestations following exposure to carbon monoxide cannot, therefore, be considered closed at the present time. It is generally agreed, however, that whatever other effects there may or may not be as a result of exposure to carbon monoxide, the principal action of the gas is to displace oxygen from the hæmoglobin molecule, as already explained, and so cause tissue asphyxia.—May R. Mayers, M.A., M.D., in *The Industrial Hygiene Bulletin* 6: 33, April 1930.

Filterability of the Infective Agent of Psittacosis in Birds

The following observations suggest that the causative agent of psittacosis in birds is filterable.

EXPERIMENT 1

Parrakeet No. 2 was injected subcutaneously with an emulsion of organs from a parrot that had been regarded as responsible for human infection, and, in addition, part of the carcass of the bird was put into the cage with the parrakeet. This parrakeet was found dead in the cage on the sixth day after inoculation.

An emulsion of the tissues of parrakeet No. 2 was used for the subcutaneous inoculation of parrakeet No. 6. This bird was sick on the seventh day, was chloroformed, and material was taken for further work.

Heart, liver, lungs, kidney, and breast muscle of parrakeet No. 6 were used to prepare an emulsion, part of which was filtered through a Berkefeld N filter. Fluid and plate cultures of this filtrate indicated sterility in the ordinary bacteriological sense. One cubic centimetre of this emulsion (filtrate) was inoculated into the breast muscle of two parrakeets, Nos. 7 and 8. Both these birds died on the seventh day after inoculation. Another portion of the emulsion of organs of parrakeet No. 6 was, at the same time that the filtration test was made, used without filtration to inoculate two parrakeets, Nos. 9 and 10 (controls). The inoculations also were made into the breast muscles, and the amount of the emulsion used was 0.25 c.c. to 0.5 c.c. Parrakeet No. 9 died on the eighth day and No. 10 on the twelfth day.

EXPERIMENT 2

Droppings from a parrot that was regarded as having caused human infection were kept dry in a refrigerator for 31 days. At the end of this time a small portion of the droppings was emulsified and part of the emulsion was filtered through a Berkefeld N filter and tested as in the preceding experiment. The filtrate and the unfiltered emulsion (control) were stored overnight in the ice box before being used for inoculation purposes.

The results of the inoculation of the filtrate and of the unfiltered emulsion into parrakeets are shown in the following table. Certain of the birds were given phenolized serum from a recently recovered case of psittacosis (human) and others were given normal human serum, also phenolized. The serum in each case was given just prior to the giving of the infecting material and at a different site.

BIRDS GIVEN FILTERED EMULSION

Bird	Other treatment	Interval between inoculation and death
A.....	None.....	Well after 20 days.
B.....	None.....	10 days.
C.....	Immune serum.....	4 hours.
D.....	Immune serum.....	14 days.
E.....	Normal serum.....	1 day.
F.....	Normal serum.....	3 days.

CONTROLS (EMULSION NOT FILTERABLE)

Bird	Other treatment	Interval between inoculation and death
G.....	None.....	Well after 20 days.
H.....	Immune serum.....	11 days.
J.....	Immune serum.....	8 days.
K.....	Normal serum.....	4 days.

This experiment shows no material difference between the tests on filtrate and on the unfiltered material. No definite influence of serum is to be seen, for while the birds given the normal serum died much earlier than those given serum from the recovered case, there was one survival of the two birds given filtrate

alone, and the single bird given only unfiltered emulsion also survived.—Charles Armstrong, G. W. McCoy, and Sara E. Branham, *Public Health Rep., U.S.A.* 45: 725, April 4, 1930.

Polycythæmia

Dr. F. Parkes Weber and Dr. O. B. Bode* have done good service in systematizing the conditions characterized by increase in the number of the red cells in the blood. They classify the polycythæmic states under the headings of erythrocytosis or secondary polycythæmia, erythræmia, hypertonic polycythæmia, and erythroleukæmia. In the first class fall all those cases of increase in the red cells following a response of the hæmopoietic system to a call for more tissue-oxygen. The physiological response is seen in the polycythæmia of high altitudes, but the same mechanism accounts for polycythæmia in certain pathological conditions such as stenosis of the pulmonary arteries, syphilitic pulmonary arteriosclerosis, and heart failure. Even in certain types of case which the authors class as "toxic"—notably the polycythæmia seen in chronic carbon monoxide poisoning, and in methæmoglobinæmia due to poisoning by the coal-tar derivatives—the same mechanism is probably at work. All cases of this type they would group under the name of erythrocytosis. Their treatment must naturally be directed towards the underlying causes.

Cases belonging to the Osler-Vaquez syndrome, which come under the heading of erythræmia, are distinguished from the foregoing by the presence, besides polycythæmia, of a grossly enlarged spleen, and the absence of any discoverable cause for the increase in the red cell count. They think this condition a primary disorder of the hæmopoietic system, comparable in every way to the leukæmias. That it is not confined to the erythrocyte-forming cells of the system is shown by the fact that the white cells, especially the polymorphs, are always increased in number, and that myelocytes and other abnormal forms of white cells may be present. If the leukæmias are to be regarded as representing a change in the blood comparable to malignant change in the fixed tissues—and there is much to support this view—erythræmia may be looked on as a malignant change mainly affecting the erythrocyte-producing portion of the hæmopoietic system. Evidence of the close relationship of erythræmia to leukæmia is afforded by those cases which start with the blood picture of erythræmia and finish with that of myeloid leukæmia with pronounced anæmia. These cases Parkes Weber and Bode would group under the

separate heading of erythroleukæmia, but there seems little necessity for this further group. All cases of erythræmia may be regarded as potentially leukæmic. Frequent and copious bleeding and phenylhydrazine are regarded as the best means of treatment, and a special warning is given against splenectomy.

It is doubtful if the third group of Parkes Weber and Bode—polycythæmia hypertonica—needs to be differentiated from the first. Polycythæmia associated with high blood pressure was first described as an entity by Gaisböck, and on the continent rejoices in an eponym. High blood pressure is found in many cases of polycythæmia, both secondary and essential, and renal disturbances are not uncommon. All cases of polycythæmia might perhaps be brought together under the first and second of the authors' groups.—*The Lancet* 1: 700, March 29, 1930.

Bleeding and Thirst

It is the custom in most hospitals to press upon a donor from whom blood has been taken a large cup of tea; in a minority of institutions beer is offered as an option; in some plain water only is provided. Except when faintness comes on in the course of withdrawal of blood donors seldom complain of thirst, but it seems only reasonable to provide as soon as possible fluid to take the place of that lost. There is a widespread idea that hæmorrhage gives rise to thirst and that this feeling is a teleological phenomenon designed to induce the organism to make up for the lost fluid. Probably a good many donors thankfully accept the proffered fluid because they feel that after losing a pint or so of blood they ought to be thirsty. Working with animals on whom such considerations can have no effect two French investigators* have been unable to find evidence that extensive hæmorrhage gives rise to any particular feeling of thirst. The animals used were horses which in the course of routine work in the preparation of therapeutic sera were bled to the extent of six litres daily for a variable number of days. They were watered in the morning before and in the evening after the withdrawal of blood. On averaging the results of observation of the fluid intake of 72 horses it was found that whereas on the days on which they were bled the intake of water was about 25 litres, on the other days it fell below this figure to the extent of only about one litre and a half, and this in spite of the fact that six litres of blood had been withdrawn. There was, moreover, no tendency for any excessive intake of water in the evenings after the bleedings. In one horse which was bled on 11

* Polycythæmia, Erythrocytosis and Erythræmia. By F. Parkes Weber and O. B. Bode. London: H. K. Lewis and Co. Ltd., 1929. Pp. 34. 3s.

* Le Soif après le Saignée, Brocq-Rousseau and G. Roussel, *Le Sang*, 1929, i, 44.

days, the evening intake of water after the bleedings was consistently less than the morning intake. The thirst following upon hæmorrhage associated with severe traumatism has long been recognised as one of the major terrors of the battlefield, but it seems probable that this thirst is due rather to the fever following upon wound infection than to loss of blood. The reserves of water in the body are by no means confined to the blood, and it would appear that they are so well conserved that it is almost impossible to seriously deplete them by withdrawal of blood to any extent that the organism can stand. In the horses used in the investigation described above no measurement of the urinary excretion of water was made; had this been done it would probably have revealed a considerable diminution following on the bleedings.—*The Lancet* 1: 703, March 29, 1930.

An Essay in Sex Determination

Prof. F. Unterberger, Director of the Gynaecological Section of the Königsberg Hospital of Mercy, has published in the current number of the *Deutsche medizinische Wochenschrift* (Feb. 21st, p. 304) an interesting account of a suggestive excursion into sex determination. He has found that the sprinkling of a little powdered sodium bicarbonate on the glans penis before cohabitation will vastly increase the probability of the resulting conception being a male. He was led to begin his investigation when he learned that sterile cows often became fertile after alkaline vaginal douching and he discovered that the acidity of the vaginal secretion was unduly high in women who came to him complaining of sterility. An alkaline vaginal douche often led to conception in these women and to his amazement always conception of a boy. Having the practitioner's dislike for vaginal douches, he then began to recommend the introduction of the sodium bicarbonate in the way indicated, whose utmost drawback has been a slight tickling sensation in consequence of the carbon dioxide evolved. The result, in a series of 53 cases in which there was a complaint either of sterility or persistent girl-bearing, was *always* a boy. In every case the vaginal acidity was high before the test. He made some attempt to check the results by animal experiment but found the technical difficulties very hard to surmount. The method is, indeed, so simple and harmless as to be tried almost without compunction on the human subject, and the Königsberg claim will no doubt lead to carefully controlled observations in this country. The success of the method would have some bearing on the mechanism of

sex determination. Prof. Unterberger is himself an adherent of the view that the ripe egg-cell is indifferent, the sex of the conception being determined by its impregnation with one or other of the two types of spermatozoon containing respectively 24 and 23 chromosomes. It does not, therefore, surprise him that the exertion of some chemical influence on the spermatozoa might lead to the preponderance of the effect of one or other of these types of spermatozoon.—*The Lancet* 1: 475, March 1, 1930.

The Peking Man

After several months' labour the skull of the Peking Man has been freed from its stony matrix and was on view at the annual meeting of the Geological Society of China recently.

Much delicate work with dentist drills and special tools was required to cut away the mass of hard travertine in which the skull was embedded. The process revealed the absence of the facial part of the skull, but the heavily developed supraorbital ridges remain, and the cranium is complete except at the base. Dr. Black stated that the study of the cleaned skull had not yet begun, and there was nothing fresh to say on the subject except that the skull showed a peculiar condition of the ear region in shape and a very unusual expansion of the tympanic bone, from which, after examination, important conclusions might be reached.

In the course of the meeting it was stated that geologists had made the interesting discovery that the volcanoes in the Tatungfu coal area in North Shansi had ejected quantities of lava, which covered the sands and clays formed approximately during the same period as the Chookoutien deposits in which the remains of the *Sinanthropus Pekinensis* were found.

Little Lectures on Medical Literature

There is no literary virtue so great as brevity. The good gardener is he who can make two blades of grass grow where one has grown before; but the good writer is he who can make one word do the work of two. This does not mean abbreviation nor incomplete sentences; it does mean eliminating all extraneous matter and saying what you have to say in the most direct style possible to convey the meaning. Don't try to put all you know into one article. Save something; you may need it later.

Some writers, apparently, write to fill space. It seems that they are trying to use as many words as possible in describing their ideas.

Clean-cut ideas do not require so many words. Therefore, get your thoughts clearly outlined and organized before you start to write. Then, after you have written, go over the article with the thought of eliminating every unnecessary word, every unnecessary expression, every unnecessary paragraph. Sometimes, you may even decide to eliminate the entire article and try again.

According to a correspondent of the *Journal* office, a certain physician made out a list of books he wanted to read, but he calculated it would take two hundred years to read them. He revised the list. Our correspondent believes that if a number of 800 and 1,000 page books were reduced to 300 pages they would be greatly improved, both as to literary quality and cost. He also suggests reducing some of the twenty-page articles in medical journals to three pages. Is he right?

Another one of his pet grievances is the bibliography. To quote him: "Did you ever read a great long article in a medical journal, and at the end of it find a bibliography as long or twice as long as the article, giving references to all literature in all languages of all parts of the earth, to everything that had ever been published on that subject since 'Heck' was a pup down to the time Al Smith was defeated, and at the same time know in your own mind that the writer never saw 5 per cent of the bibliography in his life?" To be perfectly frank about it, we have. And during the past year the *Pennsylvania Medical Journal* has attempted to eliminate all the bibliographies not cryingly demanded by the context of their accompanying papers. A bibliography, of course, is preferable to long quotations; but we believe that it would usually be sufficient, in most cases, to add a footnote that "the author

will be delighted to supply interested inquirers with a complete bibliography." We do not believe most authors would be overtaxed to supply the demand.

Becoming personal, our correspondent inquires "About what per cent of your subscribers do you suppose read all of every copy of your *Medical Journal*, and about what per cent ever read an entire copy occasionally?" We should be flattered if any of them did. A journal is not intended for total consumption, but a general journal has to compromise by publishing a variety of things, hoping that something therein will appeal to each of its readers. Nevertheless, more of the articles would certainly be read were they "boiled down to the consistency of a veritable syrup"—to quote a contributor who obligingly reduced the volume of his paper.

As a practical example of condensation, let us quote a paragraph verbatim from our correspondent, and see how much can be eliminated without damaging the sense: "Have you ever read a chapter in a medical book or an article in a medical journal and found a bibliography at the end of it about the same length and thought of the fact that possibly there are not half a dozen libraries in the United States that contain all the literature mentioned in the bibliography?" A revision might read: "Have you ever read a medical article to which was appended a bibliography of equal length and realized that possibly not six American libraries contain all the literature mentioned?" The first sentence contains 57 words, the second 29 words—a reduction of 28 words, yet both sentences mean the same thing.

Brevity, then, is not only the soul of wit; it is the wit of writing.—Mary S. Blair in *The Pennsylvania Medical Journal*, July 1929.

ANOTHER ANÆSTHETIC FOR CHILDBIRTH.—Barbituric acid derivatives have been used as anæsthetics or analgesics in France, where somnifen (allyl-isopropyl barbiturate) has had a certain vogue, and in Germany, where Bummi introduced pernokton, a brom-propyl-phenyl barbiturate. Somnifen has been used both intravenously and intramuscularly in labour, but has been condemned by some as causing drowsiness in the child and extreme restlessness in the mother. The progress of labour was also held to be impaired. The latest drug of this kind to be employed is sodium isomylethyl barbiturate, and after extensive trial on

animals a hundred cases of labour have been conducted with its aid. It was given intramuscularly after an injection of morphine and scopolamine when uterine contractions were occurring at intervals of less than ten minutes. Later intravenous injections were given. It is stated that labour was rendered almost painless without any evidence of harm to the mother, that danger to the baby has not been proved, and that prompt and complete control of eclamptic convulsions is possible. The most serious objection to the use of sodium amytal was the difficulty in restraining patients who became very restless. The drug is rapid in action and has a wide range of safe dosage.—*The Lancet* 1: 835, Oct. 19, 1929.

Abstracts from Current Literature

MEDICINE

Wie verhält sich der praktische Arzt bei Lungen-und Magenblutungen? (How should the general practitioner deal with hæmorrhage from the lung and stomach?) Schlager, C. R., *Zeitschr. f. ärzt. Fortbild.* 26: No. 18, 1929.

According to the author hæmorrhages from the lung or stomach are of a capillary origin, arterial bleeding being rare. Arterial hæmorrhage is severe, lasts for hours, and demands special measures for its control. Chief among them are rest in bed, ice-bags, and abstention from speaking. Besides these treatment should be instituted in three particular directions: (1) increasing the coagulability of the blood; (2) increasing the contraction of the vessels; and (3) the use of sedatives.

Gelatine is slow in its action, and, accordingly, the author relies on the use of calcium to increase the coagulability of the blood. In severe cases injections of serum may be employed, in cases of necessity, diphtheria antitoxin.

To obtain the desired angiospastic effect, digitalis is the first drug to be tried; adrenalin should not be used.

The sedative drugs recommended are papaverin and atropin. In all hæmorrhages of uncertain origin powerful sedatives must be employed, and the narcotic drugs as far as possible, such as codein, diodin, and dilandid. Bromides are often efficacious. In the case of pulmonary hæmorrhage lead acetate can be used to advantage. Binding the lower extremities is of doubtful value. In severe cases the induction of pneumothorax may be life-saving.

In the case of bleeding from the stomach hot enemias are useful and lavage with ice-cold water. Abstention from food and drink should be absolute for from four to six hours.

A. G. NICHOLLS

Der Wert der Pirquetschen Reaktion für die Prognose der Lungentuberkulose. (The value of the Pirquet reaction in the prognosis of pulmonary tuberculosis). Marsmann, M. W., *Zeitschr. f. Tuberk.* 55: 5, 1929.

Many observers have advanced the opinion that from the intensity of the Pirquet reaction one may draw conclusions as to the prognosis in any given case, to the effect that a strongly positive reaction indicates a more favourable outlook than a weak or negative one.

The author has examined 700 patients for the purpose of testing this proposition and con-

cludes that neither for the handling of tuberculous cases nor in regard to prognosis can any useful assistance be obtained from the test.

A. G. NICHOLLS

Meteorological and Geological Observations in Relation to Open-air Treatment and Tuberculosis. Robertson, A. N., *J. State Med.* 38: 233, April 1930.

In this article the medical superintendent of the Derbyshire County Sanatorium discusses possible factors in open-air therapeutics, the application of which has thus far been mainly empirical. Dr. Robertson, whose experience has not been limited to Derbyshire but includes that gained in other English counties, refers to the opinion of authorities in widely separated places that the gain in weight of sanatorium patients is greatest when the heat of summer has given place to the cooler weather of autumn, with associated low barometer and increased humidity. Strandgard, of Denmark, and Pai, of Madras, consider that humidity is one of the chief factors concerned in the gain in weight, and Lunde, of Norway, believes that the high relative humidity of autumn increases weight by favouring retention of water in the tissues. Against this view is placed the contention of Leonard Hill, whose studies with the katathermometer have led him to conclude that the factor of open-air treatment which influences metabolism is the cooling power of the air, increase of cooling power leading to increased metabolism.

For five years Robertson has been making careful daily observations of the cooling power of the air, by means of katathermometers, and also of temperature, relative humidity, barometric pressure, direction and rate of wind, cloudiness, amount of ultra-violet light, and amount of radiant heat. The average weekly gain or loss of weight has also been charted, and he has endeavoured to relate meteorological and weight changes. The results of his studies are not fully confirmatory of either of the teachings above noted. He did not find any consistent relationship between the patients' weight curves and temperature, barometric pressure, relative humidity, rainfall, sunshine or conditions of wind. He did find a definite relationship between the kata curves and the weight curves, but the winter experiences were the reverse of summer experiences. In winter, a high kata reading means excessive cooling power and is accompanied by loss of weight; when the kata falls the weights increase. In summer, weights rise and fall as the kata rises

and falls. Greatest gains in weight were recorded in the autumn, and this Robertson attributes to a combination of moderate cooling power with moderate radiant heat. But there were notable gains also in December, perhaps because of Christmas fare, perhaps because the high relative humidity of December may favour weight gain, as suggested by Lunde.

Robertson believes that a very complete study of the bearing of meteorological conditions is necessary, and that a physician should have scientific data upon which to base his choice of a sanatorium. He is convinced that the climatological conditions suitable for one type of case may be quite unsuitable for another. He argues that meteorology should have full consideration in deciding upon the site of a sanatorium, and that the geological formation should also be taken into account. Thus a clay soil may be a factor in causing rheumatism, and is unsuitable for cultivation by tuberculous patients.

W. H. HATTIE

The Institute of Human Relations at Yale University. Winternitz, M. C., *New Eng. J. Med.* 202: Jan. 9, 1930.

A quarter of a century ago psychiatry was taught by the example of the great clinical masters who approached the patient in a manner which imbued the latter with confidence and an optimistic view of life. Between 1905 and 1920 great changes were taking place. Chemical and physical laboratories for the scientific study of the human organism sprang up in connection with the clinical work in good schools all over the country. Specialization became the vogue. Medical schools began to turn out doctors for fractions of a man.

When a series of lectures on mental hygiene was given at Yale a hall large enough for all who wanted to come could not be found. On the average one out of every two persons has in his family a mental problem. A plan was worked out to meet the need of three groups, namely; the School of Medicine, which needed a psychiatrist to deal with problems of behaviour that are bound to arise in a student body of 5,000 young men; the Connecticut Society for Mental Hygiene; the psychopathic hospital.

The Dean of the Law School indicated a keen interest in the study of the causes underlying infractions of the law and the basis of its administration. Acknowledgment of the fact that the individual cannot be studied as a psychophysical organism unless he is also considered as a member of society, and that he cannot be understood as a member of society unless he is studied as an individual, led to a joint program for the study of man.

This enlarged plan involved the establishment of a centre, to be called the Institute of Human

Relations. Facilities already available in the vicinity are not to be duplicated. There will be 50 beds endowed as far as necessary for individuals who will be considered guests of the Institute. They may be referred from the juvenile court or from the criminal court, or they may come of their own accord. No one will come there against his wishes.

The medical student at Yale during the preliminary years, before he enters the clinic must learn the fundamentals of the sociological sciences. After the student has been exposed for two years to conditions as they actually exist in real life, while he has also been studying the principles of biology, he will go into the clinic. Here he will continue to study the psychological and sociological history of the patient at the same time that he is dealing with problems of physical health.

Every effort is made to simplify the biological approach to the problems of conduct so that the lawyer may have some background in this respect. The effort will also be made to give the medical student an appreciation of the legal approach. Students representing such various interests as law, medicine, and pure science, will rub elbows with one another. It is hoped that doctors will be trained who know man not only as a biological and psychic mechanism but also as a social mechanism.

LILLIAN A. CHASE

Von Recklinghausen's Disease. Burrell, L. S. T., *Proc. Roy. Soc. Med.* 23: 126, 1929.

Burrell reports the presence of pigmented patches and neurofibromata, ranging in size from a pea to a pigeon's egg, scattered all over the body, in three brothers and their maternal grandmother. The mother of the boys was normal.

This disease is variable in its appearance, sometimes pigmentation alone being present, sometimes accompanied by tumours. The distribution of the tumours may be general or, as in the next pedigree to be reported by Gardner, they may be confined to a single nerve. They frequently appear in persons in whom there is no hereditary history of the condition, and frequently are markedly hereditary.

MADGE THURLOW MACKLIN

Bilateral Acoustic Neurofibromas. Gardner, W. J., and Frazier, C. H., *Arch. Neurol. & Psych.* 23: 266, 1930.

In this very complete study, the authors compile a pedigree extending over five generations, comprising 217 members. Bilateral deafness was transmitted as a dominant character, passing from affected parent to some of the children and never being transmitted by those who remained free from it. Thirty-eight members of this family showed bilateral deafness, and of

these 15 subsequently became blind. Four of the blind persons were examined and shown to have choking of the optic disc and secondary optic atrophy. Of those who showed deafness only seven were examined and five had entire absence of vestibular responses in the Bárány test. The other two showed marked diminution in the vestibular responses. There were four others who showed neither deafness nor blindness, but all vestibular responses were lacking in the Bárány test, so that the diagnosis of bilateral acoustic tumour was practically indisputable. The two members of the family who came to autopsy had bilateral acoustic neurofibromata.

The average age of onset of deafness was 20 years. The average age of death of those affected in the second generation was 72; in the third 63; in the fourth 42; and in the fifth 28. This progressively earlier death from tumours in successive generations is not at all uncommon.

The family history is of great interest. The man in the first generation who had bilateral deafness was the father of twelve children, seven girls and five boys, all of whom inherited their father's deafness. Concerning eleven of them and their descendants nothing further is known. The twelfth child, a male, was the progenitor of all the remaining affected members. He married twice, and had four children by each wife. From the first marriage, there were two normal daughters who between them had twelve normal children and thirty-nine normal grandchildren. The third daughter was deaf but left no children. The fourth daughter, deaf, had eight children, four normal, two sons who were deaf, and two daughters blind and deaf. One of these daughters had three normal children and three who were blind and deaf; the second daughter had two normal sons, and two blind and deaf daughters. Of the two deaf sons in the fourth generation, one left five normal children, the other eight normal children and one blind and deaf son.

By the second marriage of the man in the second generation, there were also four children, the first a normal daughter who had seven normal children and seventeen normal grandchildren, next, two blind and deaf sons, one of whom left eight normal children and one deaf and one deaf and blind daughter. The fourth child in this family by the second wife was a deaf daughter who left beside seven normal children, one deaf and blind daughter and two deaf daughters to pass on the heritage. One of these had a deaf son as well as three normal sons, and the other had three children deaf and blind, one deaf son and seven normal offspring.

Thus there were in the first generation one abnormal, in the second, twelve; in the third, five; in the fourth, nine; and in the fifth, eleven. When we consider that the 3rd, 4th and 5th generations here were descended from one man,

and that the other eleven in the 2nd generation probably left behind them as tragic a tale of inheritance, one cannot remain unconvinced of the fact that inheritance of some diseases is a too well established fact.

MADGE THURLOW MACKLIN

Two Cases of Joint Changes. Scott, J. W., *Proc. Roy. Soc. Med.* 22: 1519, 1929.

These two cases represent, according to Scott, a peculiar type of chondrodystrophy in which the axial skeleton was more involved than the appendicular. At the age of 4 years in both sisters there appeared swellings of the wrists, fingers and knees with delayed growth in height. The vertebrae were flattened, there was a double coxa vara with mushrooming of the head of the femur and lipping of the acetabulum. The heads of the phalanges were enlarged, but there were no definite arthritic changes in the fingers. The upper arms and trunk were particularly shortened. No pain or deterioration of bone was present while the joint changes were progressing. Marked limitation of movement was noticeable in all affected joints. There were no evidences of septic foci; the spleen was not enlarged; the Wassermann test was negative; mental and sexual development were normal.

MADGE THURLOW MACKLIN

SURGERY

Short Circuit Operations in the Treatment of Cholecystitis. Robinson, R. H. O. B., *The Lancet* 1: March 29, 1930.

After an introduction on the anatomy and physiology of the gall bladder, Mr. Robinson reports results on various forms of operative treatment in cholecystitis. Certain facts are of interest. In 281 cases of cholelithiasis, in which the gall stones were confined to the gall bladder, jaundice occurred at some stage in 36 per cent. In 174 cases treated by cholecystectomy in St. Thomas's Hospital 49 per cent remained cured, 22 per cent were relieved and 29 per cent were failures. Of the unsatisfactory cases 35 per cent have been re-operated upon. In 176 cases treated by cholecystectomy, 73 per cent were cured, 16 per cent were relieved and 11 per cent were failures. The mortality rate in cholecystostomy was 9 per cent and in cholecystectomy 6 per cent.

Mr. Robinson suggests cholecystgastrostomy or cholecystoduodenostomy in those cases in which there is pancreatitis, cholangitis, or suspected obstruction in the common duct, which cannot be found, or where it is feared it will develop. Apart from carcinomatous obstruction 18 cases have been done at St. Thomas's Hospital since 1923 without a death and practically all cases have remained cured. He

states that an acute infection in the gall bladder wall is not a contraindication to the operation provided it has not progressed to the stage of gangrene.

In cholecystgastrostomy the gastric curves were all within normal range. He has found no evidence of cholangitis developing post-operatively. His own experimental work showed a tremendous hypertrophy of the unstriated muscle, the deepening of the mucous membrane and the absence of inflammation in the gall bladder wall. Microscopic sections of the liver showed nothing abnormal.

W. L. GRAHAM

Eight Hundred Consecutive Operations for Appendicitis. Raw, S., *Brit. M. J.* 1: 483, March 15, 1930.

The author reports 912 personally treated cases, with a mortality of 1.75 per cent. Of these 599 were acute, 168 being perforative. A McBurney incision was used in every case in which the diagnosis was definite. The appendix was not removed in cases of generalized purulent peritonitis where it did not present in the wounds. It was left in in 40 patients, of whom 7 died. In no case was the peritoneal cavity drained. After closure of the peritoneum a drain was placed down to this area.

Contra-indications to operation are (1) when the attack has practically subsided before the patient is seen; (2) when the patient is unable to stand an operation (intercurrent disability); (3) when operation is refused. Otherwise the author believes operation should follow diagnosis in all cases.

S. GORDON

The Intra-Abdominal Post-Operative Complications of Appendicitis. Ochsner, A., Gage, S. M., and Garside E., *Ann. Surg.* 91: 544, April 1930.

Peritonitis, ileus, residual abscesses and pylephlebitis are the usual intra-abdominal complications of inflammatory lesions of the appendix, although any extension of infection beyond the appendix is in reality a complication. The incidence of complications depends upon the extent of the infection at the time the patient is seen by the surgeon. It varies with the age of the patient, the care previously exercised, the treatment instituted, the virulence of the organism responsible, and the resistance of the patient.

Peritonitis is relatively rare, but accounts for 65 to 77.5 per cent of the deaths. Properly used conservative therapy will lower the incidence and the mortality rate. Ileus forms 6 to 15 per cent of the post-operative complications of appendicitis. Here the bowel and peritoneal cavity are sources of toxins, the ileus almost invariably being due to infection.

Early ileostomy, saline solution, and spinal anaesthesia are valuable aids in treating this complication.

Residual abscesses occur in 1.8 to 5.7 per cent of cases, the pouch of Douglas being the most frequent site. They also occur in the right iliac fossa, subphrenic space, and on the left side. Continued fever, abdominal pain, and localized tenderness are found in these cases. Abscesses in the pouch of Douglas are best drained through the rectum. Right- or left-sided abscesses, if not improving on conservative treatment, must be drained without entering the free peritoneal cavity. In cases of subphrenic abscess exploratory puncture is not justifiable. Fluoroscopy shows limitation of movement of the diaphragm and moderate pleural effusion. Conservative treatment should be tried, but if no improvement results incision and drainage must be done. This is best carried out by resecting a portion of the 12th rib.

Pylephlebitis is the most serious complication, the prognosis being bad. The occurrence of a chill or chills, fever, and profuse sweats is practically diagnostic. Operative interference is fatal, except in cases of solitary abscess formation.

S. GORDON

An Analysis of Post-Operative Complications.

Fuller, C. J., *The Lancet* 1: 115, Jan. 18, 1930.

There were 1,478 operations at University College Hospital during 1927, and 124 of the patients had post-operative lung complications. Bronchitis occurred 24 times; 20 times after abdominal operations and twice after the removal of a growth from the pharynx, once after thyroidectomy, and once after nephrolithotomy. Lobar pneumonia occurred twice. Both patients died. An epidemic of mild influenza was prevalent in the wards at the time and the pneumonia may have been of the influenzal type. There were 75 cases of broncho-pneumonia. They occurred mainly after two classes of operation, the first involving the upper abdomen, and the second the mouth, pharynx and upper respiratory tract. One case of broncho-pneumonia was followed by empyema, and another by infarction of the lung. There were 9 other cases of infarction of the lung. Abscess of the lung occurred four times, and massive collapse, eight. The latter complication occurred four times after abdominal operations, twice after nephrectomy, and once after hemilaryngectomy.

The operations most frequently followed by lung complications were those performed for perforating gastric ulcer. Next in frequency came other operations involving the stomach and duodenum. In discussing the etiology the

writer says that the length of operation is of no importance. All the patients were given ether or chloroform except when there was special reason for fearing a lung complication. Local anaesthesia or gas oxygen were then used.

The three main conditions necessary to produce post-operative pneumonia are: (1) the presence of organisms in the lungs, either before the operation or aspirated during the period of unconsciousness; (2) the inhibition of respiratory movements and in particular those of the diaphragm; (3) the lowering of the patient's resistance.

As to prevention, the writer thinks that very careful attention should be paid to the examination of the chest beforehand, and a close enquiry into a possible history of recent coughs and colds.

W. B. HOWELL

OBSTETRICS AND GYNÆCOLOGY

Radiation and Surgical Treatment of Carcinoma of the Body of the Uterus. Healey, W. P., and Cutler, M., *Am. J. of Gyn. & Obst.* 19: 457, 1930.

In a review of 100 cases of carcinoma of the fundus, Healey found that the average age of the patient was 56 years, and that 25 per cent of cases occurred in nulliparous women. Histologically, the lesion is conveniently divided into four classes:—

Class 1—The superficial adenoma malignum is a superficial growth which does not infiltrate. This class is best treated by curettage and radium. Class 2—The adenoma malignum is somewhat more malignant. Here the percentage of cures with radium, or radium followed by hysterectomy is about 65 per cent. Class 3—Adenocarcinoma is a tumour which infiltrates the underlying stroma and is much more malignant. Only 18 per cent of cases treated by radiation were cured. Class 4—Diffuse carcinoma, a tumour which completely replaces the glands, is very malignant but also very radio-sensitive. In this class of case hysterectomy alone shows no cures, while with radiation 6 out of 12 cases were cured.

On the whole the percentage of cures in 82 cases of operable carcinoma treated by radium alone was 58.5 per cent. The success of the treatment seems to depend on an adequate dose of radium, since the first three groups are radio-resistant growths.

ELEANOR PERCIVAL

Still-birth due to Intracranial Injury. Partidge, J., *J. Obst. & Gyn. of Brit. Emp.* 37: 1, 1930.

As a result of civilization, increasing difficulties in parturition occur, due to an increase in cranial development. Nearly 50 per cent of

children, alive at the onset of labour, who are deadborn die as the result of disproportion; either the head is too large or the pelvis too small. And since the greater cranial capacity of more cultured races is apt to be reproduced in the skull of the new-born, the problem is how to increase the maternal pelvis to allow the safe delivery of infants of greater cranial capacity. This is most easily accomplished by remembering that the pelvis is not a rigid bony ring. The pelvic joints, the sacro-iliac and the pubic, permit of slight mobility in the majority of cases, although this is very slight in some cases, especially in a patient over 35. In a series of 100 cases examined as to mobility of the pubic joint, the percentage of stillbirth was lowest during the years when the normal mobility of the joints was greatest. The Walcher position, the squatting position, pubiotomy, etc., are helpful in all cases with mobile joints, and if used opportunely will help to reduce the numbers of such deaths. However, great judgment must be exercised. If the disproportion is too great or the pelvis too rigid Casarean section is recommended, for with trial labour the children of the best cranial stock are subjected to the greatest risks.

ELEANOR PERCIVAL

Dry Labour. Norris, C. C., *Am. J. Obst. & Gyn.* 19: 4, April, 1930.

The presence of a normal quantity of liquor amnii and the integrity of the membranes are of vital importance to the well-being of both the fetus and the mother and premature rupture of the bag of waters may be followed by disastrous consequences.

Causes of premature rupture are trauma, disease of the membranes, unusual thinness or friability of the tissues, increased intra-uterine pressure from twins, monsters, hydramnios, or unduly strong uterine contractions. Among the ward cases in the hospital of the University of Pennsylvania, dry labour occurred in about 7 per cent of deliveries, and among the author's private patients in only 5.3 per cent. Infection occurs more frequently in dry labours. Premature rupture of the membranes is supposed to be more frequent than it actually is.

Premature rupture of the membranes tends to prolong labour, to arrest rotation, and to permit development of contraction rings. The patient often becomes exhausted, discouraged, and highly nervous. Uterine atony is likely to ensue. The fetus may suffer from compression. The amniotic cavity may be infected in the early stage of labour, or even before its onset. Intrauterine infection accounts for the death of some of the children born during dry labour (DeLee). Premature rupture of the membranes is more serious for primiparae.

Preventive treatment includes avoidance of trauma, straining, heavy lifting, purgatives, and of anything that is likely to stimulate uterine contractions. After rupture, and before labour sets in, treatment consists of rest in bed, the wearing of a sterile vulvar pad, interdiction of coitus, vaginal douches, and vaginal examinations. If labour has not begun after twenty-four hours, therapeutic induction is usually indicated (by means of quinine and castor oil; rectal tube or colpeurynter under strict aseptic precautions). The progress of labour must be watched carefully, since compression of the child may result in asphyxia or intracranial hæmorrhage. Fetal heart sounds must be carefully watched. If the patient becomes exhausted, morphine or chloral will often provide sufficient rest to allow her to complete the delivery spontaneously, or at least to be delivered with a low forceps operation. It may be necessary to effect rotation under deep anæsthesia. Cæsarean section may occasionally be justifiable. Tetanic uterine contractions call for administration of a general anæsthetic. Post-partum hæmorrhage is more common in dry labour. A dry labour is essentially a complicated labour, and can be treated most advantageously in a well-equipped maternity hospital.

ROSS MITCHELL

PÆDIATRICS

The Treatment of Erysipelas in Infants. Eley, R. C., *Am. J. Dis. Child.* 39: 529, March 1930.

Thirty-three infants, from two weeks to twenty months of age, with erysipelas, were treated with antistreptococcus (erysipelas) serum in doses of about 10 c.c. daily until disappearance of the lesions. The intramuscular route was used except in desperate cases, when the initial treatment was given intravenously. Usually six to eight injections were given before the streptodermatitis subsided. The most striking effect of the serum was the disappearance of the signs of intoxication. Early administration is important. In those patients admitted after 72 hours of illness the mortality was 64 per cent; the total mortality for the series was 36 per cent. Examination of the tables shows that in 12 of the 33 patients the face or face and scalp region alone was involved, and of these nine recovered. Consecutive cases were treated, no controls being employed. Eley believes anti-streptococcus erysipelas serum to be of definite value in the treatment of infants.

A. K. GEDDES

An Unusual Case of Congenital Pyloric Stenosis.

Steen, R. E., *Arch. Dis. Child.* 5: 76, Feb. 1930.

A female child, born seven weeks before term, weighing five pounds at birth, and never breast-

fed, progressed satisfactorily until the age of two weeks, when projectile vomiting, constipation, and loss of weight began, persisted for two months, and abruptly ceased. A quiescent period of two months followed, with gain in weight and good stools. Then at the age of 4½ months, another severe bout of vomiting and constipation occurred and persisted for one week. In the two subsequent weeks the infant was free from symptoms and gained eighteen ounces. At the age of 5¼ months the third and final bout of vomiting began. On admission to hospital at the age of 7 months, greatly wasted and dehydrated, and with a palpable pyloric tumour, she was treated medically until death occurred at the age of 7½ months. At necropsy the greatly hypertrophied pylorus would not admit a probe.

The author suggests that the prematurity may have been a factor in the prolongation of symptoms to the age of 7½ months. This and the remarkably long intermissions make the case unique.

A. K. GEDDES

Calcium Metabolism in the Acute Stages of Chorea in Children. Warner, E. C., *The Lancet* 1: 339, 1930.

The author has previously shown that in the acute stages of chorea there is an increased excitability of the neuro-muscular junction to electrical stimulation, resembling that found in the tetanic manifestations of "low calcium rickets". This gradually passes off as recovery takes place and the present investigation was to determine if this hyperexcitability is also associated with any changes in the blood calcium findings. The technique of the calcium determinations is given in detail and the importance of the various technical points is considered. A control group of cases from the poorer class of the population were found to have calcium figures below the normal level and it is suggested that all poorly nourished children suffer a certain calcium deficiency. Both controls and the chorea group were, however, from the same classes. There is found to be a lowering of the serum calcium during the acute phase of chorea and this returns to the control level as the symptoms subside, the electrical excitability following the same course. The calcium of the cerebrospinal fluid also shows a depression at the same time and this also rises as the electrical excitability diminishes. This deficiency amounts to from 13 to 15 per cent of the total calcium and it is presumed that the brain and nerve tissues are bathed in a calcium-deficient medium during the acute stages. It is suggested that this may shed some light on the genesis of chorea which occurs during the period of greatest bone formation and tends to recur during adult life

only during pregnancy, when there is another demand for calcium which may impoverish the blood stream and the cerebro-spinal tissues.

J. B. ROSS

High Phosphorus Concentrations in Infantile Tetany. Marples, E., and Crump, E., *Am. J. Dis. Child.* 39: 536, March 1930.

Infantile tetany is generally considered to be due to a decreased concentration of calcium ions, and blood analyses usually show the serum calcium to be less than 7.5 mgm. per 100 c.c. of serum, with the inorganic phosphorus at or slightly below the normal level. These authors find that there are on record in the literature 13 cases of infantile tetany in which the phosphorus content of the serum exceeded the normal values. A review of the cases at the New York Nursery and Child's Hospital over a four and a half years' period showed that of a total of 80 cases of infantile tetany elevated values for inorganic phosphorus (more than 7 mgm. per 100 c.c. of serum) occurred in 20 cases, or 25 per cent. Fifteen per cent of these cases of high phosphorus tetany had a calcium value in excess of 7.5 mgm. per 100 c.c., in the presence of very definite clinical signs. The group with high phosphorus values differed in no respect clinically from those in which the inorganic phosphorus content was at a normal or low level.

A. K. GEDDES

Salt Content of Woman's Milk in some Cases in which its Use was not Beneficial. Courtney, A. M., and Brown, A., *Arch. Dis. Child.* 5: 28, Feb. 1930.

The observation that one-third of the infants admitted to the Toronto Hospital for Sick Children with a diagnosis of tetany had been breast-fed for a period of six months or more led Courtney and Brown to make complete salt analyses of the mother's milk in these cases. The values for magnesium, and especially for calcium, tended to be low (either low normal or less than normal) in the 17 milk samples from mothers of infants with rickets or tetany, while the values for phosphorus tended to be high. Blood determinations on four of the infants receiving low-calcium breast milk showed either low calcium or low phosphorus, or both. Investigation of the diet of these mothers, especially from the point of view of vitamins and milk intake, showed it to be deficient in all cases.

Milk samples were also examined from mothers of 13 infants who presented other unfavourable symptoms (not rickets or tetany) supposedly due to the quality of the breast milk. These milk samples showed many abnormal values for the various salts with a tendency to high concentration of total salt.

A. K. GEDDES

UROLOGY

Ruptured Kidney. Shapiro, E. Z., *J. Urol.* 33: 343, March 1930.

Rupture of the kidney appears to be an increasingly common accident. It occurs in several ways: (a) direct trauma by which the kidney is driven against the lower ribs or against the transverse processes of the first and second lumbar vertebrae; (b) indirect trauma, as when a man falling lands on his feet; (c) muscular action producing abrupt flexion, as when jumping backward or dodging objects; (d) spontaneous rupture. This always occurs in kidneys the seat of disease such as hydronephrosis, cyst, arteriosclerosis.

The results of rupture are classified by Bugbee as follows: (a) a tear of the fatty capsule; (b) subcapsular hæmorrhage; (c) slight contusion or laceration of the parenchyma; (d) complete pulping; (e) partial or complete tearing of the pelvis, ureter, and blood vessels; (f) rupture of the peritoneum; (g) injury to other viscera.

When the perirenal capsule is intact an effusion of blood and urine collects inside the capsule; when it is torn the tumour forms in the perirenal tissue, and as the pressure in the mass of effusion increases it ultimately becomes great enough to automatically control further bleeding. Absorption may be complete, but more frequently there is increased pain, enlargement of the tumour, temperature and other manifestations of infection, requiring drainage or possibly nephrectomy. When the peritoneum is torn, also, fatal hæmorrhage may rapidly follow rupture of a renal vessel, or the entrance of urine into the peritoneal cavity may induce a fatal peritonitis.

Hæmaturia, pain and tumour are usually considered cardinal symptoms of ruptured kidney. It must be remembered, however that severe injury may be present without this sign, as the ureter may be torn or blocked by clot or there may be a tear in the renal vessels; hence its presence is not constant. Ecchymosis in the flank is not an infrequent sign and is of much diagnostic significance. Exceptionally the blood may pass along the spermatic vessels, and in such event the ecchymosis appears in the thigh, at the root of the penis, in the scrotum or perineum. A case is noted where such occurrence led to a diagnosis and operation for extravasation, and only at autopsy was it found that the blood had burrowed from the kidney region.

Pain is very variable. It is felt in the loin and radiates down to the thigh, penis and scrotum, exceptionally it may be felt in the uninjured side. Pain results from infiltration of the tissues rather than damage to the kidney substance, since there are no sensory nerves in

the kidney substance proper. It can be understood therefore that a slight injury which leaves the perirenal capsule intact may give rise to more intense pain than a more severe injury in which the capsule is widely torn and a more free escape allowed. The passage of blood clot down the ureter may give rise to a typical colic.

Many of these cases will get well if kept at rest with local application of ice, but if there are signs of continued bleeding, surgical interference is called for. If the injury is slight approximation of the fragments and control of hemorrhage may be possible. But if the bleeding cannot be controlled, if the vessels or ureter are torn, or if there is infection or associated disease of the kidney, nephrectomy is imperative.

N. E. BERRY

The Colon as site of Focal Infection in Chronic Pyelitis, Cystitis and Prostatitis. Redewill, F. H., Potter, J. E., and Garrison, H. A., *J. Am. M. Ass.* 94: 688, March 8, 1930.

The enormous number and variety of bacteria in the intestines is a well established fact, the *B. coli* being perhaps the most important. Two questions arise; first, autointoxication from stasis, and, secondly, the passage of bacteria from the bowel to the circulation. Those who deny the first event base their stand on three arguments: (1) no poison is found in the blood stream; (2) evacuation quickly relieves the symptoms caused by constipation; (3) the symptoms are caused by distension of the bowel. These arguments do not stand investigation, and the conclusion is that autointoxication is a definite entity; if a virulent organism is present in the bowel the patient can suffer from the poison produced. As regards the passage into the circulation of bacteria, that has also been satisfactorily demonstrated in normal as well as diseased systems.

It is the urinary system that is most often attacked by these migrating bacteria, especially the *B. coli*, proved by agglutination tests and in many other ways, e.g., cases with pyelitis are cured by colonic irrigations; urethritis may be caused by *B. coli* from the colon, where a flare up has preceded the attack. The authors report 22 cases of urinary tract disease where colonic stasis was indicated by the bacteriological examination of the stools, the presence of undigested carbohydrate food, and other suggestive substances.

In these cases treatment of the colonic condition cleared up the genito-urinary infections very quickly, although they had often resisted other treatment for long periods. This series also gives convincing proof of the migration of bacteria from the intestine to the genito-urinary tract. There seems no doubt that the colon

plays a very important part in the non-gonorrheal genito-urinary infections.

As regards treatment, a diet of whole wheat bread, milk, lactose, and increased vegetable protein; colonic irrigations daily for two weeks; implantations of cultures of *B. coli* into the lower bowel; and acidophilus milk, properly made and handled, are the main items.

Obviously no urinary infection of a non-gonorrheal nature should be treated without treating the colon as well.

P. M. MACDONNELL

ORTHOPÆDICS

Treatment of Fractured Neck of the Femur with especial Regard to the Results. Groves, E. W., *J. Bone & Joint Surg.* 12: 1, Jan. 1930.

Mr. Groves speaks of the importance of the subject, and of the frequent inaccuracy about falls and of the unsoundness of advice about it. He gives three common errors: (1) the treatment of hip injuries without making an exact diagnosis by the x-ray; (2) considering that an old patient with a fractured femoral neck is unsuitable for active treatment; and (3) the idea that non-union of the fracture is the result of old age and that a young adult will therefore recover if treated by simple traction. Of course the truth is that transcervical or intracapsular fractures are quite common in young patients and that such fractures will never unite unless special methods are employed to secure firm apposition of the fragments.

Mr. Groves puts forth the following propositions: (1) careful diagnosis of all cases of hip injury by x-ray is necessary; impaction is very difficult to determine as to existence or degree.

(2) Adequate treatment should be given to secure the best chances of union in correct position at any age. Such treatment may be instituted a week or ten days after the accident, giving time for recovery from shock. The fixation of the hip in a patient of 70 or 80 years never can, never did, and never will cause death from hypostatic pneumonia. (3) Fractures of the transcervical or intracapsular variety are of quite common occurrence in young or middle-aged patients. Such fractures will never unite unless natural (by Whitman method) or artificially induced (by pegging) impaction of the fragments is brought about.

(4) Fractures of the basal or extracapsular variety are liable to impaction, accompanied by comminution and great distortion. Such a condition urgently demands disimpaction at the earliest possible moment. These fractures have a great tendency to malunion, but they always unite quickly and strongly. What are the average results to be expected from efficient primary treatments? In 24 unselected personal

cases bony union was obtained in 20 and good results in 16, with 2 deaths. In a number (116) of hospital cases from the clinics of men taking special interest there were 15 per cent of deaths, 23 per cent cases of non-union, and 42 per cent good results.

What method of primary treatment gives the best results? This depends on where the fracture is. In regard to true intracapsular (or transcervical) fractures there are only two methods worth consideration for comparison, viz., the Whitman abduction method and the pegging operation. Traction methods are not efficient here. In regard to extracapsular or basal fractures, the Whitman abduction treatment or skeletal traction may be used effectively, providing that disimpaction of the fracture be carried out as a preliminary. Open operation here need not be considered, first because comminution renders bone suture or pegging difficult, and second because this type of fracture shows no tendency to non-union and hence open operation is unnecessary. Mr. Groves states that he has had the same percentage of good results (75 per cent) with both the Whitman abduction method and the pegging operation.

Is it necessary to choose one of these two methods to the exclusion of the other? Mr. Groves prefers to peg even recent intracapsular fractures in young and active patients, reserving the Whitman abduction method for a primary treatment of intracapsular cases in elderly or weakly or mentally enfeebled patients. In cases where the Whitman method has failed after three months' trial pegging should be done.

At what period after the injury and under what circumstances may union be brought about by operation? Mr. Groves' figures show that good bony union can be obtained in four out of five cases, even though the age is as much as 68 and the period since fracture as much as 23 months. In the case of really feeble old patients the question of operation will not arise. Such patients will be treated with a walking splint or will remain bedridden. In regard to those of vigorous habits of life, advanced age does not bar the pegging operation, providing the conditions are found favourable at operation. If not, the head of the bone should be removed and a reconstruction of the joint performed. Remove the head when it and the neck are soft and friable, when the articular cartilage is destroyed, when the neck is gone, and when the head has no capsular attachments to give it a blood supply, other than the ligamentum teres.

If a pegging operation is successful it gives a very much better functional result than the reconstruction of the hip. Pegging should be done with exposure of the fracture and not

blindly, especially as the whole essence of the open operation is to remove (as in a fractured patella) the soft parts (capsular fibres particularly) which lie between the fractured surfaces. In late cases for non-union, Mr. Groves removes the head from the acetabulum for a more complete examination of bone, cartilage and blood supply. It can then be nailed to the shaft by a bone peg with accuracy. Mr. Groves prefers a beef bone or ivory peg three-eighths of an inch thick and $3\frac{1}{2}$ inches long. It takes longer to absorb than the whale or fibular graft and so preserves its rigid support much longer.

J. A. NUTTER

NEUROLOGY AND PSYCHIATRY

Traumatic Cerebral Hæmorrhage. Maitland and Beling, *Arch. of Neurol. & Psych.* 22: 1001, Nov. 1929.

This is a presentation of fatal cases of cranial traumatism with particular attention to the type characterized by multiple concussion hæmorrhages, and also a review of a series of cases of concussion with late evidence of brain damage. After a brief summary of some of the more outstanding contributions of the past, the authors give an account of their study of 309 autopsies on persons dying of cerebral injuries, no less than 189 of which were the result of "traffic" accidents. Of these 8.2 per cent were cases of extradural hæmorrhage, the pathogenesis, clinical picture, and treatment of which are too well known to need description. Cortical laceration and hæmorrhage constituted 82 per cent of the series. In these, the usual pathological finding was pia-arachnoid hæmorrhage, associated with small multiple hæmorrhages in the cortex; 57 per cent of the cases were at the site of contre-coup and almost always unassociated with fracture in that particular locality.

The most interesting cases were those of deep multiple hæmorrhage without fracture of the skull or gross surface lesions. In most of these the only gross evidences of injury were multiple small, discrete, punctate, and sometimes confluent hæmorrhages in the deeper portions of the brain, especially the basal ganglia. Microscopic examination revealed these hæmorrhages as cross sections of capillaries filled with erythrocytes which had leaked through into and distended the perivascular spaces. There was a remarkable similarity in point of distribution and their "ring" character between these lesions and those associated with epidemic encephalitis, the type of cell involved being different, of course. The authors agree with Cassasa that these are "concussion hæmorrhages," although they discuss at some length the possible importance of fat emboli as causes of the hæmorrhages. They found unquestionable evidence of fat embolism

in some cases, but conclude that this had little significance. Naturally, cases of this type are difficult of diagnosis.

Five clinical cases are reported in detail in which, following head injury with concussion, various clinical syndromes subsequently developed. The authors feel that the trauma was of distinct etiological importance in the late development of states resembling paralysis agitans, disseminated sclerosis, and progressive lenticular degeneration. They draw attention to the possible importance of these late sequelæ in cases where questions of compensation and assessment of damages arise.

A. T. MATHERS

Changes in the Spinal Cord in Anæmia. Weil and Davidson, *Arch. of Neurol. & Psych.* 22: 965, Nov. 1929.

This article is a critical examination of the statement that the pathological condition commonly known as "combined sclerosis" may appear in other types of anæmia than the pernicious form. It is a well documented and well illustrated clinico-microscopic study of ten cases of pernicious anæmia, seven of gastric carcinoma with secondary anæmia, fourteen of various malignancies with anæmia, six of Hodgkin's disease with anæmia, seven of lymphosarcoma with anæmia, six of tuberculosis with anæmia and four of leukæmia.

The authors conclude from a survey of the literature that there is no good evidence that spinal cord changes occur in the anæmias caused by either acute or chronic loss of blood. In the review of their own cases of pernicious anæmia, they contribute nothing new. Carcinoma of the stomach is commonly cited as proving the occurrence of subacute combined degeneration in anæmias other than Addison's. Their cases failed to support the view of relationship, and they look upon the association of the two either as fortuitous or the result of vertebral or meningeal metastases. Other types of malignancy presented spinal cord abnormalities, but on microscopic examination none proved to be due to subacute combined sclerosis. Neurological conditions appearing in Hodgkin's disease, lymphosarcoma, and tuberculosis with secondary anæmia frequently suggested subacute combined degeneration clinically, but pathological examination revealed histological pictures of a different nature. None of their cases of leukæmia presented neurological disturbances.

The authors conclude from their rather small number of cases that "anæmias of the hæmolytic type, especially progressive pernicious anæmia" are the only anæmias in which genuine subacute combined degeneration occurs, and that not the anæmia itself but toxins of unknown origin acting simultaneously on the

hæmatopoietic and nervous system are responsible. The highly suggestive cases in which carcinoma of the stomach and subacute degeneration are coincidental are, they believe, cases of combined cancer and pernicious anæmia. The changes in the cord in other anæmias are myelomalacias resulting from vascular disease of various types, and in neoplastic disease are due to vertebral or meningeal metastases.

A. T. MATHERS

THERAPEUTICS

The Nirvanol Treatment of Chorea. Whitaker, W. M., *Arch. Dis. Child.* 5: 44, Feb. 1930.

Nirvanol was first introduced for the treatment of chorea by Roeder in 1919, and the German literature has since contained many favourable reports of its use. It is a white tasteless powder, belongs to the barbituric acid group of hypnotics, and has one less CO group than luminal. Its intensive use over a continuous period produces with considerable constancy an exanthem which is known as nirvanol sickness. The bodily reaction associated with nirvanol sickness appears to have curative effect in chorea.

Strict rest in bed with careful observation during the treatment is imperative, since the drug is a potent one. A daily dose of 4.5 grains of nirvanol is given until an exanthem or enanthem or signs of toxicity appear, when the drug is abruptly discontinued. The reaction, which usually occurs from seven to fourteen days after treatment is initiated, consists ordinarily of a morbilliform rash with or without fever, preceded by a period of drowsiness. There may be headache, conjunctival injection, and diplopia. Eosinophilia is very common during the nirvanol sickness and in two of the author's cases was the only sign of reaction to the drug. The blood picture must therefore be carefully watched. No alarming symptoms were noted at any time in Whitaker's series. The erythrocytes, hæmoglobin, and the cardiac condition remained unchanged. Two non-rheumatic children given nirvanol as controls showed no difference in the type of reaction.

In most of the eleven cases of this series there was a marked improvement in the chorea within one week after the nirvanol sickness and in every case active chorea disappeared within one month. The author recommends further trial of nirvanol, especially in the more severe cases of chorea.

Similarly encouraging results are reported by Ashby in this journal (p. 42), in a series of 12 cases of chorea. He concludes that nirvanol is safe and superior to other drugs in the treatment of chorea.

A. K. GEDDES

Rush Inoculation with Special Reference to Hay Fever Treatment. Freeman, J., *The Lancet* 1: 744, Apr. 5, 1930.

A brief review of the history of hay fever inoculation therapy shows that this was first attempted in 1903 and has been in use under the usual present methods since 1909. Later, in 1924, a more intensive method of treatment was used by the author and his associates, whereby an injection was given every day with gradually increasing doses. This met with such success that he has made use of it as a routine since that time. A still more rapid series of injections is now presented, this method having been tested over a period of almost two years, with successful results and the advantage of a much shorter time of treatment. This protracted length of inoculations is what makes many patients fail to follow the course to a conclusion. The patient is given an injection every hour and a half or two hours throughout a fourteen-hour day, the original dose being about 100 units of the offending protein. With an increase of from 10 to 20 per cent at each dose this rapidly mounts to perhaps twenty thousand in a few days and immunity is established. This method necessitates that the patient be in a hospital or under the care of a competent nurse and reactions must be watched for as carefully as ever. The great advantages are the short space of time and the fact that it may be used when the patient has actually begun to feel distress from the onset of his hay fever in May or June. Cases are cited of dust-sensitivity, fish-sensitivity, horse-asthma and hay fever in which good results were obtained, with a long duration of immunity.

J. B. ROSS

The Interaction of Ultra-violet and Infra-red Rays. Brown, R. K., *Brit. J. of Actin. & Physio.* 5: 8, April, 1930.

In this article Dr. King Brown reviews studies made in various parts of the world. In the early enthusiasm for the ultra-violet rays, the possible effect of other rays received little consideration. More recently it has been realized that the light and heat rays have a somewhat separate field of utility, as evidenced by the benefits resulting from exposure to sunlight. This has suggested that these rays may assist the ultra-violet rays. Apparatus designed by Hagemann and others to combine light rays with ultra-violet rays has not as yet been productive of precise evidence of utility. Investigations made at the University of Ghent indicate that combined infra-red and ultra-violet radiations are less lethal to *B. coli* than ultra-violet radiations alone. Various observers have noted that when heat rays are applied after ultra-violet rays, the effect of the latter is more or less neutralized. Thus Theder-

ing points out that "red antagonizes violet, and ultra-violet inflammation, including sunburn, should be combated by red light." Others have shown that it is possible to render the activation of vitamin D ineffective by subsequent irradiation by red light. It would seem, therefore, that when heat rays are applied simultaneously with or subsequent to the ultra-violet rays, the action of the latter is limited or neutralized. A clinical study by Shattock and Waller has yielded confirmatory evidence. They have found that beating of the tissues by conduction or radiation either concurrently or subsequent to ultra-violet irradiation diminishes or suppresses the actinic erythema and delays its appearance. On the other hand, these observers state that when heat is applied before ultra-violet irradiation, the actinic erythema is increased and the time of its appearance is not appreciably influenced. "But," according to Brown, "the advisability of thus interfering with what may be called the normal effect of ultra-violet rays is still an unsettled question. Further clinical research is obviously essential before a definite pronouncement can be made."

W. H. HATTIE

HYGIENE AND PUBLIC HEALTH

An Epidemic of Influenza in an Isolated Community. Smillie, W. G., *Am. J. Hyg.* 11: 392, March, 1930.

This is an epidemiological study of an outbreak of influenza which occurred at Northwest River, Labrador, in the spring months of 1928. In this compact, comfortably-housed, community of 167 persons, in which a Grenfell Mission hospital is maintained, epidemics have been rare, but influenza had ravaged the settlement in 1918. In November, 1927, the ice closed down and communication with other settlements ceased. Soon after this isolation was effected, there were one or two cases of acute respiratory disease, but the infection did not spread. About the first of February, the superintendent of the Mission went to Rigolet, a distance of a hundred miles, where influenza was then prevalent. On getting back to the Mission on the fifth of February, he was quite ill with influenza. Two days later a member of the Mission staff became ill, and the infection spread rapidly through the Mission hospital, then to the Mission boarding school, and finally to the individual homes. The last case developed on the first of May. Ninety persons suffered from symptoms which warranted a diagnosis of influenza, while 31 others suffered from milder respiratory infections. Only 46 escaped more or less severe infection, and of these 32 were under the age of 15 years. Children under ten years of age showed a high

degree of immunity, while no person aged 50 or over escaped infection.

About the middle of June, a month after the last case had recovered, a band of nomad Indians came into the post. They had had no respiratory illnesses during the winter. Although presumably highly susceptible to influenza, none of them developed any acute respiratory infection, indicating that no carriers remained or that the causal agent, if still present, had lost virulence. Nasopharyngeal cultures of the native population at this time showed no essential difference from those of the Indians.

The unique feature of the epidemic is that it occurred in so completely isolated a community. The date of introduction of the infection is certain. The incubation period in the first case which developed in the post was two days, the patient having been in intimate contact with the man who brought in the infection. From this case the disease spread first to intimate contacts and then in concentric circles until every home in the community was invaded. Virulence did not increase despite rapid passage from person to person. Dosage of infection would seem to have been fairly uniform. Susceptibility seems to have been the important variable, as the younger age groups (quite as much exposed as the others) suffered least. This relative insusceptibility of young persons would also appear to indicate that resistance was non-specific, as if it were specific the older age groups would have been the more likely to be resistant.

W. H. HATTIE

Study of Influenza Mortality in Six Epidemics 1920-1929. *Pub. Health Rep., U. S. Pub. Health Service*, Feb. 21, 1930.

An interesting study of weekly death rates from respiratory diseases, recorded as influenza and pneumonia, in 95 cities of the United States during the period from 1920 to 1929 has just been made by the United States Treasury Department.

From January 1, 1920, to the middle of 1929 six distinct epidemics of more or less national extent have occurred in the United States (1920, 1922, 1923, 1926, during the spring of 1928 and the winter of 1928-1929). These six epidemics caused, in excess of the expected seasonal mortality from the disease in question, about 250,000 deaths, about half as many as occurred during the great pandemic of 1918-19. About one-fifth of these excess deaths occurred during the recent epidemic of the winter 1928-29, and about two-fifths during the early months of 1920.

The point of origin, and the duration and rate of progress of the six major epidemics have been carefully studied. The 1920 one rose

in the East North Central section and rapidly spread to all parts of the country. The central half of the deaths occurred in a period of about 16 days. The epidemic of 1922 arose in the middle Atlantic states and reached its maximum in 22 days. In 1923 the East South Central Section was first affected and showed a time-concentration of 30 days. The 1926 and the 1928-29 epidemics arose on the West Coast and reached their maximum in 23 and 21 days respectively, and the small epidemic of the spring of 1928, arising in the mountains, gave the second longest time-concentration, namely 27 days.

R. VANCE WARD

RADIOLOGY

Tuberculous Mediastinitis. Kornblum, K., and Cooper, D. A., *Am. J. of Roentgenol. & Radium Ther.* 23: 276, March 1930.

Five cases are presented showing marked involvement of the mediastinum and little evidence of pulmonary tuberculosis. However, not only the tracheobronchial glands but the adjacent mediastinal structures must be involved before the condition may be called tuberculous mediastinitis. This condition is described carefully by the authors as a distinct entity in diagnosis. The pathology, clinical and roentgenological findings and symptomatology are described, and case reports and autopsy records are added. The illustrations are good. The treatment consists of a general tuberculosis regimen with heliotherapy, roentgenotherapy, and surgery when suppuration occurs.

A. STANLEY KIRKLAND

A Clinical and Roentgenological Consideration of Pulmonary Infarction. Kirklin, B. R., and Faust, F. S., *Am. J. Roentgenol. & Radium Ther.* 23: 265, March 1930.

It is stated that congestion of the lung favours infarction. Thus, in cases of cardiac disease the danger of infarction is greater. Infarcts are rarely single, usually occurring in groups of from ten to twenty. The signs and symptoms of pulmonary infarction are discussed. The clinical diagnosis in a typical case, with acute dyspnoea, pleuritis, pain and friction rub, rapid pulse and circulatory embarrassment, gross expectoration of blood, is easy. The same can be said when such an accident occurs following operation. The roentgen-ray examination is a valuable adjunct in making a diagnosis of pulmonary damage in cases of infarction. A full description of x-ray findings follows. Twenty-five cases are reviewed with necropsy reports in eight. In seventeen cases, the condition followed operation. In six, the accident occurred in patients suffering with cardiac decompensation.

It is admitted that it is difficult, or often impossible, to make a diagnosis from the roentgenograms alone. The clinical history is most necessary in interpretation of x-ray findings.

A. STANLEY KIRKLAND

The Analgesic Effects of Roentgen Rays with especial Consideration of Bone Metastases of Cancer. Borak, J., *Radiology* 14: 328, April 1930.

The mode of action of roentgen rays and pure analgesics is fundamentally different. The roentgen rays can influence solely a pain that has arisen under pathological conditions. The relief from pain following roentgen therapy occurs after varying periods of time, continues a varying length of time, being sometimes lasting, whereas, with pure analgesics the effect becomes evident immediately and continues for a very limited time. The roentgen rays act as an analgesic only when they act therapeutically. They act as an analgesic only so long and only to the extent that they exert healing effects.

The biological significance and distribution of bony metastases of cancer is carefully described. The mechanism of causation of pain by these metastases is explained and case histories are provided. The action of x-rays on the cancer cells in the bone is shown and it is stated that the analgesic effects of roentgen rays are thus not of a symptomatic nature but are expressions of genuine therapeutic action.

A. STANLEY KIRKLAND

ANÆSTHESIA

Clinical Experiences with Percain, a new local Anæsthetic. Lake, N. C., and Marshall, C. J., *Brit. M. J.* 1: 488, March 15, 1930.

Percain is a quinoline derivative. It is soluble in water. The solution can be sterilized by boiling without deterioration. Percain is the most powerful local anæsthetic known and has a prolonged period of action. Weight for weight it is four times as toxic as cocaine, but there is not the slightest likelihood of anything approaching the lethal dose being needed for operative procedures. The effect lasts from two to six hours.

The writers have used this drug during four months for local infiltrations, spinal and paravertebral anæsthesias and splanchnic block. The concentrations used were 1:1,000 and 1:2,000. No toxic effects were observed, no

undue tissue reaction, nor any interference with healing.

Percain has special advantages as a spinal anæsthetic. The anæsthesia may last as long as six hours. The most prolonged abdominal operation may therefore be performed under intrathecal injection alone. The fall of blood pressure is less severe than with novocaine, though it persists much longer. It can be to a large extent overcome by the administration of ephedrine and by position, during, and for several hours after operation.

W. B. HOWELL

Observations on Spinal Anæsthesia. Stabins, S. J., and Morton, J. J., *Ann. Surg.* 91: 242, 1930.

This paper is based on the observation of 100 cases of spinal anæsthesia. The writers used neocaine crystals at first, but later changed to spinocaine and found it more reliable. The duration of anæsthesia was from 1¼ to 1¾ hours. A preliminary dose of ephedrine was given 15 minutes before the spinal injection.

The incidence of post-operative lung complications was found to be as high as after inhalation anæsthesia. There were 2 cases of pneumonia, both fatal. A patient died from broncho-pneumonia. Hypostatic pneumonia occurred once. There were 7 other cases of post-operative lung complications, but these had had either supplementary inhalation anæsthesia or were handicapped by what the writers call "lung pathology".

There was much less post-operative nausea, vomiting, gas pains and distension than after inhalation anæsthesia. Distension, when it did occur, was found to be particularly persistent. Some patients complained afterwards of tinnitus, dizziness, blurring of vision, and headache. One had diplopia and temporary paralysis of the sixth nerve. One patient, an elderly man with generalized arteriosclerosis and high blood pressure, returned from the operating room after an operation for cholecystitis in a state of collapse and died five days later from uræmia.

The relaxation of the abdominal muscles and the contraction of the bowels make spinal anæsthesia almost ideal for operations for ventral hernia in fat patients, for cholecystectomy, in pelvic operations, and in those performed for cancer of the large bowel and intestinal obstruction.

W. B. HOWELL

B.C.G. OR B.G.C.—A reprint of an article by Dr. H. E. Kleinschmidt, of the National Tuberculosis Association office, contains a remark by Dr. Edward O.

Otis, Professor of Tufts Medical College and a veteran in the tuberculosis crusade. He advised that the order of the initials B.C.G. be changed to B.G.C. and made spell "Better Go Cautiously."

Obituaries

J. Bradford McConnell, M.D., D.C.L., one of the oldest practising physicians of Montreal, died on April 5, 1930, at his residence. Dr. McConnell was about 79 years of age and was born at Chatham in Argenteuil County. He had been in excellent health up until a week before his death when he contracted a heavy cold. Pneumonia later set in, culminating in his death.

Educated first at Dr. Wanless' Academy at Carillon, Que., he entered McGill University and received his M.D., C.M. degrees in 1873. Following post-graduate work in Germany he returned to enter medical practice in Montreal. He later joined the teaching staff of the medical school of the University of Bishop's College, located in Montreal, successively filling the chairs of materia medica, pathology, clinical medicine and associate in medicine. He was acting dean of the medical school at the time of the amalgamation of this institution with McGill University in 1905. He was honoured with the degree of D.C.L. by Bishop's University in 1905.

Dr. McConnell was one of the founders of the Western Hospital and was for several years editor of the *Canadian Medical Record*. He served as representative on the Board of the College of Physicians and Surgeons of the Province of Quebec, and was Assistant Surgeon to the Prince of Wales Rifles from 1875 to 1884.

In August of 1923 Dr. McConnell celebrated his fiftieth year of active medical work, and was presented with a fine travelling bag together with a parchment containing the signatures of more than one hundred former students, associates and friends.

In addition to medical work, Dr. McConnell took a wide interest in scientific, community and social affairs. He was Vice-president of the Royal Astronomical Society; Examiner for the Aetna Life Insurance Company and for the Mutual Life. As a prominent Odd Fellow, he filled the position of grand master of the Grand Lodge of Quebec in 1884 and 1885.

He married twice. His first wife, who died twelve years ago, was Miss Theodora Lovell Miller. There were eight children, four of whom are still living. In addition, he is survived by his second wife, formerly Miss Georgina Kerr Kaye; four brothers, Richard McConnell of Ottawa; Hugh McConnell of Montreal; Gilbert and James McConnell of Vancouver; and two sisters, Mrs. J. T. Ayers and Miss Jean McConnell, both of Montreal.

AN APPRECIATION

A grand old man in medicine has passed from our midst in the person of Dr. J. B. McConnell, a man of very fine principles, and one who did a great deal of work not only for the suffering poor but also in furthering the cause of scientific medicine.

He was Professor of Medicine in Bishop's College

up to the time of its amalgamation with McGill in 1905. He was the Dean of the Bishop's College Medical School for some years, and while in this office was a very great help to many young men who found themselves in difficult circumstances.

He was most genial in personality, and his smile carried courage and comfort to all to whom it was given. He was never known to have said an unkind word about anyone. A keen student and a pleasing teacher, his passing is a decided loss to the medical profession.

H. L. REDDY

Harold Hunter Corbin, M.D., C.M. Unexpectedly the call came to Dr. H. R. Corbin, of Halifax, and he passed away, April 18, 1930, at the Victoria General

Hospital, barely half an hour after he had been admitted. For two or three days he had some throat infection, but was about the house even on Friday, serious symptoms not showing until the evening of his death.

Dr. Corbin was born in Halifax, some thirty years ago, a son of the late Everett Corbin. Besides his mother he is survived by an aunt, Miss Minnie Corbin, in the United States, and two uncles, Judge Blois, of the Juvenile Court, and H. H. Blois, Principal of the Bloomfield school.

Following his graduation at Dalhousie in 1923, he had a year's internship and then began special work both at home and abroad in eye, ear, nose and throat. He began practice in Halifax some four years ago. He was not permitted to follow the even tenor of his way in confining his activities to his professional duties. He was elected alderman in Ward 4, in 1927, and was active and faithful in his discharge of his civic duties. He was appointed to the Board of Health of Halifax City, automatically becoming its Chairman, and to the Board of School Commissioners. He was a member of the Halifax Branch of the Medical Society and the Canadian Medical Association. He had well established himself in practice and would have undoubtedly become a successful specialist.

His funeral was almost a civic one, the Police Department, the Health Board, the Firemen, the Mayor and Aldermen, and many members of the medical and legal professions, and the staff of Dalhousie University being present.

Dr. William S. Cody, a well-known physician in Hamilton, Ont., for about 30 years, died on April 21, 1930, at his home. Dr. Cody was born in Newmarket in 1858, graduated from the University of Toronto in 1884, and was the principal for several years of the Collegiate Institute in Windsor. Dr. Cody then came to Hamilton and engaged in the practice of medicine.



Dr. J. Bradford McConnell

He graduated also from the Detroit Homœopathic College in 1905. He is survived by four sons and two daughters.

Dr. William Gunn died in Clinton, Ont., May 3rd. Born near Beaverton in 1854, he was the seventh of the nine children of John and Christina Gunn. He attended school in Beaverton and Toronto, studied at Victoria University, and received his medical degree from the University of Toronto in 1881. After post-graduate work in Edinburgh, where he took the qualification of L.R.C.P. & S., Dr. Gunn settled in Huron County, and for 33 years engaged in general practice, giving as the years went on more time to surgery. Dr. Gunn was endowed with resourcefulness that was nothing short of genius. To this his Old Country training added thoroughness of scholarship, skilful technique and a wholesome touch of conservatism. This combination enabled him to perform, often with the simplest surgical appliances, and in unfavourable environment, many operations that were considered both delicate and difficult by skilful surgeons working in specially equipped operating theatres and with trained assistants. Dr. Gunn rendered to the community in which he worked the combined services of a highly gifted specialist and a broad-minded general practitioner. In 1901 Dr. Gunn opened a hospital in Clinton, primarily for surgical cases, which he carried on successfully until 1915, when for two years he gave war service in the Old Country. After 1920 he gradually retired from active practice, but there are still many people who remember him as a beloved physician and friend of early days, and many doctors who look back to their student days with Dr. Gunn as their chief inspiration in their work to-day. Forty-two years ago Dr. Gunn was married to Christina Ross, daughter of the late Rev. Alexander Ross of Pietou, Nova Scotia. Her death occurred three years ago. Two daughters survive, Marion Gunn of Clinton, and Mrs. Edgar Cross of Toronto, also three grandchildren and a sister, Mrs. John Ross of Nethy Bridge, Scotland.

Colonel Edmund Eleazar King died on April 28, 1930, at St. Michael's Hospital, Toronto, aged 68 years. His death was due to septic poisoning, which developed from an injury to his foot received three weeks ago.

He is survived by one daughter, Mrs. N. O. Wheeler; one son, Captain E. O. King; one sister, Mrs. W. G. MacKendrick, Oakville, and one brother, C. Frank, of Buffalo. Another brother, Lieut.-Col. H. J. King, was last heard of while on active service in France. Five grandchildren also survive.

AN APPRECIATION

In the passing of Edmund E. King in his 69th year the medical profession of Toronto lost one of its most beloved and respected members. Born in Brantford, Ontario, Dr. King received his preliminary education in the local schools and his medical training at Victoria University, Toronto School of Medicine, and in London, England.

If one were asked to state the most outstanding feature of his career, the reply would probably refer to the remarkable diversity of interests which engaged his attention and the prominence which he gained in a multiplicity of organizations and societies. His chief interest, however, apart from the passionate love for his wife and family, and the warm feeling for a host of friends, was his profession. As a surgeon he achieved a notable place in genito-urinary and rectal work. At St. Michael's Hospital he had the unique distinction of serving as an active member of the visiting staff from the foundation of that institution in 1890 until his death within its portals on April 28, 1930. During all those years he never ceased to give all that was in him for the good of his patients and the welfare of the hospital. When the Medical Advisory Board was formed in 1914, he was unanimously chosen as chairman, a position he continued to occupy

with ability and satisfaction to all concerned. For many years he was also Chairman of the Medical Board and chief surgeon to the Hospital for Incurables.

At other times he held the presidency of the Ontario College of Physicians and Surgeons, the Ontario Medical Association, the Toronto Academy of Medicine, and the Esculapian Club.

At the Esculapian Club for many years past his position was unparalleled and will be impossible to fill. Although latterly known only by the name of treasurer, he was in reality general manager and guiding spirit. As is known to the local profession, the Esculapian Club is a society which meets once a month at dinner and listens to an invited speaker on some subject outside of medicine. The club has a limited membership, and it is a notable fact that there was seldom a vacant chair, for the excellence and variety of the cuisine was unique. This was entirely due to the planning and originality of Dr. King. It was never too much trouble for him to personally visit various markets, shops, hotels and clubs, or even telegraph distant cities in order to secure the best of some particular article he decided upon for the menu.

For many years he acted as chief judge of the babies at the Canadian National Exposition and there his picturesque figure and apt remarks will be sadly missed.

He found time to take an interest in the development of photography, and at one time was president of the Toronto Camera Club. This association with photography possibly led to his interest in x-ray work, in which he was a pioneer amongst the medical practitioners of Toronto.

In Masonry his associations were with Ionic Lodge, St. Patrick Chapter of the Royal Arch Masons and Toronto Lodge of Perfection, Scottish Rite Masons.

Apart from the above-mentioned interests one must note his military associations. First he was identified with E Company, Queen's Own Rifles, leaving in 1885 to serve with No. 1 Field Hospital in the North-West Rebellion. From 1885 to 1915, he was Medical Officer of the Royal Grenadiers, retiring three years ago with the rank of colonel.

Impressive scenes were witnessed at the funeral, which was held under military auspices. A reverent silence was observed for blocks around as the soldiers presented arms and the casket carrying the remains of the late Colonel was borne from his home on Queen Street in one of the busiest sections of the city. From thence the cortège advanced through great crowds of people past the hospital which he had served so long and faithfully. The procession then moved by way of Jarvis and Yonge Streets to Mount Pleasant Cemetery, where at the graveside the firing party fired their last salute and the buglers sounded the "Last Post."

JULIAN LOUDON

Dr. H. H. Ross died at Richard's Landing, Ont., on April 20, 1930, in his 96th year. Born in Scotland, Dr. Ross came to Canada in 1848 with his parents, settling in Oxford County and then in Kincardine. Receiving his early education in the local schools he later entered the University of Michigan and took his degree in medicine at Ann Arbor. In his early years Dr. Ross was surgeon of the Canadian Pacific Railway, then building from Port Arthur to Jackfish, and settled later at Richard's Landing, where in addition to practising medicine he took a lively interest in civic and political affairs. He is survived by a large family, and leaves behind him many who looked upon him as the "grand old man" of St. Joseph's Island.

Dr. William James Harris, of Toronto, died at the Lockwood Clinic on May 3, 1930, after an operation for appendicitis. Born at Glencoe, Ontario, he graduated from Trinity Medical College in 1902. For several years he was resident physician at the Toronto General Hos-

pital and the Ontario hospitals in Toronto and London. Before commencing general practice in Toronto, in 1912, he took post-graduate courses at the London hospital, England, and at the Rotunda, Dublin. Interment was in the family plot at Glencoe.

Dr. Alexander James Murray, London, Ont., died

on April 30, 1930. He graduated from Trinity Medical College, Toronto, in 1891.

We wish to correct an error that appeared in the Obituary column last month. The notice regarding the late Dr. F. J. Farley was written by Dr. N. B. Gwyn and not by Dr. George Young.

News Items

BRITISH EMPIRE

The St. John Ambulance Association

As an extension of the work of the St. John Ambulance Association, the first of three special rail coaches, designed to promote first-aid instruction among the 100,000 employees of the Canadian National Railways Company, has just been brought into use. The cars, which are miniature hospitals, including the latest emergency equipment and lecture theatres for first-aid demonstrations, will be used primarily in the more remote parts of Canada where the opportunities for the study of first aid under competent instructors are limited. Employees of the railway are encouraged to attend lectures on first aid in working hours, a corps of experts being retained for demonstration purposes. A special Canadian National Railway Council of the St. John Ambulance Association was established some years ago, and as a result of its activity 35,000 employees have obtained certificates of proficiency in first aid.

Psittacosis in Canada

An Order-in-Council issued by the Department of Agriculture under the authority of the animal contagious diseases act prohibits the importation into Canada of parrots, parakeets, cockatoos, macaws, lorries, lorikeys, and love birds.

This step, announced on May 13th, was deemed necessary by the Department of National Health as a measure toward the control of an outbreak of psittacosis,

or parrot fever in British Columbia. Up to the present time 11 cases have been reported from Pacific coast ports in that province.

During the months of March and April a total of 112 birds of the various parrot species has been brought into Canadian Pacific coastal ports by sailors, and it is believed, that these imported sailor pets have been the cause of the disease coming into Canada.

While outbreaks of psittacosis have been reported in various countries from time to time, this is the first time it has made its appearance in the Dominion.

The Canadian National Committee on Mental Hygiene

Organization for the development of mental health has been brought to a high degree of perfection in Canada. At the recent meeting of the newly-formed International Committee on Mental Hygiene, the President, Mr. Charles H. Ruggles had this to say on the subject: "Along educative lines one of the outstanding pieces of work in the world during the past ten years has been done in the Province of Ontario. There the combination of public education with the assembling of professional personnel has been remarkable."

Mr. Ruggles also paid tribute to the work of Dr. Clarence M. Hincks, medical director of the Canadian National Committee on Mental Hygiene, saying other parts of the world needed "a Hincks."

GREAT BRITAIN

A New Post-graduate Medical School for London

For lack of sufficiently broad foundations, post-graduate medical education has not flourished in London. Now comes a proposal which seems likely to establish the work on the four pillars of the Ministry of Health, the London County Council, the University of London, and the medical profession. The Post-Graduate Medical Education Committee, which was appointed in July, 1925, by Mr. Neville Chamberlain, recommends that a British Post-Graduate Hospital and Medical School shall be instituted and suggests that the existing hospital in Ducane-road, Hammersmith, which is now the property of the London County Council, shall be utilized for the purpose. It is estimated that this will cost from £200,000 to £250,000. This hospital is of recent construction, is well equipped, and occupies a position easy of access.

The Committee's scheme gives a hospital with 400 beds and a medical school, residential facilities for post-graduate students to be established on a site permitting of future expansion. Residential facilities for students should be provided in part at the hospital, but mainly at a separate hostel in the medical and social centre of London.

At question time in the House of Commons Mr.

Greenwood announced details of an approved plan in connection with the scheme. The Government is to give £250,000 towards building and equipping a medical school in connection with the Hammersmith Hospital. Public subscriptions are to be invited to establish a hostel—to be called London House—where both Empire and British students can live. Mr. Chamberlain warmly welcomed this result of the work of a committee which dates back to his time and guidance.

In regard to this proposal the Master of Trinity Hall has this to say.

"The proposal to establish in London a post-graduate hospital and medical school will be welcome not only to those who have the cause of medical education at heart, but also to all who desire to strengthen and maintain the bonds which unite the Mother Country with the Dominions and Colonies of the British Empire.

A period of advanced and specialized study after graduation is an invaluable and essential part of the training of every young medical man whose ambition it is to become a research worker, a teacher, or a member of the staff of a large hospital. It is usually necessary, it is always desirable, that the young graduate should complete his training by travel and visits to those medical schools which offer the best opportunity for the study of the subject of his choice.

From the Imperial standpoint alone it would seem to be a matter of the first importance that medical graduates from the Dominions and Colonies should find in England the facilities for the further study and experience which they need and which hitherto they have been obliged too often to seek in foreign lands.

The possibilities of London and of the other great cities of this country as places of study for medical graduates are enormous. Nowhere else in the world can be found so vast a clinical material for study.

National Radium Centres

Twelve National Radium Centres have been nominated by the Radium Commission, as being places where there are medical schools with complete clinical courses and where treatment of patients can be combined with the education in approved methods of radium therapy. The centres are:—

England.—Birmingham, Bristol, Leeds, Liverpool, Manchester, Newcastle, and Sheffield.

Scotland.—Aberdeen, Dundee, Edinburgh, and Glasgow.

Wales.—Cardiff.

Loans of radium are being restricted in each area to one hospital selected by the Medical Faculty of the local university. The following centres have completed their organization and have been supplied with radium: Birmingham, Cardiff, Edinburgh, and Aberdeen. Three other centres, Manchester, Glasgow, and Newcastle, will receive their radium almost immediately.

London has been treated as a separate and special problem, and steps have been taken to organize two centres to carry out special work of general and national importance.

Approximately 17 grammes of radium out of a possible total of about 22 have been ordered and provisionally allocated by the Commission to National Centres. Of this quantity, nine grammes have already been received from the manufacturers, and, after being tested at the National Physical Laboratory, $6\frac{1}{4}$ have been delivered to centres and a further $3\frac{1}{2}$ will be going out very shortly.

In collaboration with the Medical Research Council and the British Empire Cancer Campaign, a set of "Radium National Forms" for the use of recognized Centres has been prepared, in order that the clinical records of all cases treated may be kept on a uniform basis and eventually incorporated in general national statistics.

Psittacosis and the Importation of Parrots

The Ministry of Health and the Department of Health for Scotland have issued orders prohibiting the importation into this country of "all birds of the parrot species" after May 19th. This step is taken for the protection of the public against psittacosis, and the regulations will not apply to parrots required for medical or veterinary research or those consigned to the zoological societies or to persons specially authorised. In the House of Commons on April 16th Miss Susan Lawrence stated that "information has been received in the Ministry of Health of 80 cases of illness which commenced during the present year and in which the patients had been associated with sick parrots." Thirteen of these cases proved fatal and in nine of them psittacosis appeared on the death certificate as the cause of death. In stopping the importation of parrots Great Britain is following the example of most of the other countries in which the disease has appeared. A review of the subject just published by the secretariat of the League of Nations describes the incidence in these countries and goes on to discuss the etiology at length. Bacteriologists in France, Germany, and the United States have now confirmed the observations which Bedson, Western, and Levy Simpson reported in the issues of *The Lancet*,

February 1st and 15th, and it is generally agreed that the disease is caused by a filterable virus.

Gift to the Radcliffe Infirmary

The Radcliffe Infirmary, Oxford, is one of the principal beneficiaries by the generosity of Sir William Morris, chairman of Morris Motors, Limited. In a speech at Plymouth Sir William said that dividends amounting to £200,000 had been allowed to him because he had not enough to pay the charitable institutions which were looking to him for support. Of this sum no less than £140,000 will be paid to the Radcliffe Infirmary for various objects. Some time ago Sir William promised to build a new maternity department for the infirmary at a cost of about £40,000, and at the end of last year he offered £100,000 for the purchase of a site for the extension of the hospital, which at present is badly overcrowded.

The Radcliffe Observatory is affected by the latter scheme, for the only outlet for the extension of the hospital is on land which forms part of the Observatory grounds. As the matter stands at present the extension site will be purchased by the governors of the infirmary, and the Radcliffe Observatory will be removed to Africa in five years' time, when the work of classification of some 30,000 faint stars upon which it is now engaged has been completed.

Opinion in the University is divided, but there is a feeling, which has been expressed by Lord Birkenhead in his letter to *The Times*, that a benefaction intended for Oxford should remain in Oxford. The Observatory was erected at the request of the University authorities in 1772, but its position in relation to the University has never been exactly defined, and remains in doubt even at the present time.

£100,000 for St. Thomas's Hospital

A gift of £100,000 to St. Thomas's Hospital, London, is announced. The donor is Lady Houston, who has given instructions for the transfer of securities to that amount to the institution. The gift has been made without conditions, and will be paid into the general fund of St. Thomas's.

The Royal College of Physicians of Edinburgh

The College has decided to celebrate its 250th anniversary of its foundation on St. Andrew's Day, 1931.

Intimation is made of a bequest by Mrs. Isabella Kirk Duncanson for the foundation of a Fellowship in Medical Research.

A Memorial to Sir Patrick Manson

Patrick Manson died on April 9, 1922—a leader in medical science and one of the world's benefactors. His genius first established the principle of insect transmission of disease. At the International Medical Congress in London in 1913 he was acclaimed the "Father of Modern Tropical Medicine." His influence continues in the increasing health (and wealth) of the tropics and inspires all who endeavour to overcome obstacles to development caused by tropical disease.

Historically Manson's great work begins in Amoy in 1877 with his demonstration that the filarial worm which inflicts on man the terrible disease of elephantiasis is conveyed by certain mosquitoes. This was no chance discovery, but the reward of labour added to that of daily practice in tropical heat among the sick in hospital and homes, and was made in an academical and professional isolation known only to some of his disciples. It involved the study of the little worm in the human blood and the tracing of it into the stomach of the mosquito, and thence into the thoracic muscles, where it developed into another form which could mean only one thing—namely, that the worm was

preparing itself for entering into the body of another man. With this observation the science of modern tropical medicine was born, for it was subsequently found that insects are responsible for the spread of many other tropical diseases—malaria, sleeping sickness, yellow fever—to mention only a few.

Manson's unshakable conviction that malaria, the most important of all tropical diseases, was transmitted by mosquitoes was no inspired guess. Although he did not completely envisage the mechanism of infection this conviction was founded on his long critical watching of the malarial parasite in human blood and led Ronald Ross to final victory, despite all difficulties and obstruction. It was in the clear light of Manson's great induction and in constant counsel with him that Ross worked and conquered.

Though these are outstanding gifts of Manson, he made many other contributions of lasting value to the better understanding of tropical diseases, but, above all, he realized the professional isolation of the young worker in the tropics who, sent out untrained, had to learn in the bitter school of experience—a system which frequently brought disaster to the unfortunate sufferer from tropical maladies of which his doctor was profoundly ignorant. Appointed Medical Adviser to the Colonial Office in 1897, Manson gained the effective support of Mr. Joseph Chamberlain and the no less practical aid of Sir Percival Nairne and Sir James Michelli, of the Seamen's Hospital Society. With this help Manson founded in 1899 the London School of Tropical Medicine, where he taught for over 20 years. It is a true claim that all schools of tropical medicine in all countries owe their birth to Manson. Their pupils, commencing their tropical labours with knowledge in the place of ignorance, are making the tropics permanent conquests for civilization.

Manson's pioneer work added one of the brightest chapters to medical history and showed how great a future for the benefit of mankind awaited its further development. It was urgent, if this development was not to be retarded, that the world-wide scattered workers should be brought together—their spiritual union strengthened by formal bonds of association. So in 1907 Manson joined Sir James Cantlie and others in founding the Society of Tropical Medicine and Hygiene. He was its first president. The society became Royal in 1921 and in 1924 was further honoured with the gracious patronage of his Majesty the King. Its objects are completely and tersely proclaimed in its motto—*Zonæ Torridæ Tutamen*. Among its Fellows, now numbering close on fifteen hundred of many nationalities, are those most distinguished in tropical medicine. Its *Transactions* are indispensable for all who would keep abreast

of new work in tropical medicine and hygiene. From a small beginning the society has grown to its present position, but its work is hampered by the lack of suitable premises for its meetings and where Fellows can exchange ideas and discuss the problems of tropical pathology.

What nobler conception could there be than a home for the society dedicated to its first president, Sir Patrick Manson? At present there is no memorial. It has accordingly been decided to name the house after him and thus to keep ever prominent the memory of this great man and the ideals for which he laboured.

Though their work has given incomputable wealth to the tropics, the workers in tropical medicine are not, as a rule, themselves blessed with much of this world's goods. The Fellows and some friends of the society have subscribed over £6,000 towards getting the desired home. In making an appeal for £20,000 the Fellows believe that many outside the small professional circle of tropical medicine, when they realize Manson's influence in the development of tropical lands, will wish to help in establishing so fitting a memorial to the Father of Modern Tropical Medicine.

Donations will be gratefully acknowledged if sent to the President, Dr. G. Carmichael Low, at the Royal Society of Tropical Medicine and Hygiene, 11, Chandos-street, Cavendish-square, London, W.1.

Dawson Williams Memorial Prize

The establishment of this prize was due to a desire to commemorate the work of the late Sir Dawson Williams, Editor of the *British Medical Journal*, and in view of his special interest in the question of pædiatrics it was resolved that the interest accruing from the funds collected should be devoted to a prize in connection with that subject, to be awarded every two years, or at longer intervals, in the discretion of the Trustees, who are the Presidents for the time being of the Royal College of Physicians of London, the Royal College of Surgeons of England, the British Medical Association, the Royal Society of Medicine, the Section of Diseases of Children of the Royal Society of Medicine, and the Editor of the *British Medical Journal*. The prize is open to any registered medical practitioner in the British Empire, and takes the form of a cheque for 50 guineas.

The first award of the Memorial Prize has been made to Dr. F. J. Poynton, senior physician to the Hospital for Sick Children, Great Ormond-street, for his work on behalf of rheumatic children, particularly with regard to the establishment of special "rheumatic centres."

NOVA SCOTIA

Work has been commenced on the new building for the Digby Hospital.

According to a report of the Chief Fire Marshall for Nova Scotia, more than 80 per cent of the hospitals of the province have adopted safety x-ray films, and most of the others have the adoption of such films under consideration.

Dr. C. M. Bayne, of Sydney, has been appointed to the Provincial Department of Health as Divisional Health Officer for the Eastern Health Division. Dr. Bayne graduated at Dalhousie in 1920, and was for several years on the staff of the Nova Scotia Sanatorium, rising to the position of Assistant Medical Superintendent of that institution.

A movement is on foot to establish the Victorian Order of Nurses in Glace Bay. Several of the physicians of the town are actively interested in the proposal, and a strong committee has been appointed to endeavour to effect organization.

The fine residence of the Medical Superintendent of the Nova Scotia Hospital, Dartmouth, was badly damaged by fire on May 1. Dr. Lawlor lost many valued personal effects, including a number of antiques and articles of historical interest.

The committee in charge of the Dalhousie Medical Refresher Course are engaged on the arrangement of this year's course, which will be given early in September. It is possible that some of our British col-

leagues, who are to attend the Winnipeg meeting, may take part in the course.

In his second annual report to the provincial legislature, Dr. Clyde Marshall, Provincial Psychiatrist, analyses his investigations of the mentality of a large number of children referred to him by Juvenile Courts, Children's Aid Societies, Orphanages, Schools, and other agencies. Of the total, 49 per cent were classed as feeble-minded, and 11 per cent as doubtful. The remainder were listed as backward, dull, or average, with the exception of one boy, found in a county home, who was found to be of superior intelligence—a sad commentary on a system which permits of such a child to be cared for in so doubtful an environment. Dr. Marshall gives a detailed description of the unit of the Nova Scotia Training School now being constructed near Truro, which is expected to be ready for occupancy about the first of June. The plans for the completed institution are such that Dr. Marshall considers it "will be one of the best in Canada, and one of which we may well feel proud."

Nova Scotia physicians continue to play prominent parts in political circles. At a recent meeting of the provincial Conservative Association, Dr. F. R. Little, of Halifax, was appointed to the provincial executive and Drs. J. Rankine, of Halifax, and Grant, of Inverness, were appointed to county executives. Dr. M. G. Burris has been elected chairman of the Dartmouth Liberal Association and has also been appointed to the executive of the Halifax-County Liberal organization, and Dr. W. D. Forrest has been re-elected to the presidency of the Halifax County Conservative Association.

The annual meeting of the Halifax Branch of the Medical Society of Nova Scotia was held at the Dalhousie Clinic on April 23rd. This is usually a dinner meeting, but the dinner was cancelled this year out of respect to the memories of Drs. H. H. Corbin and J. N. Lyons, esteemed members of the Society, who died a few days before the date of the meeting. Dr. Lyons was the vice-president of the Society and, had he lived, would doubtless have been advanced to the presidency. Appropriate action was taken expressive of the esteem in which the deceased members had been held and of the loss occasioned to the profession by their deaths. Dr. Walter L. Muir was elected *President*, Dr. Frank Mack, *Vice-president*, and Dr. Norman H. Gosse, *Secretary-treasurer* for the ensuing year.

Reports of interest to the medical profession, which were presented at the recent session of the provincial legislature, include those of the Nova Scotia Hospital (for the Insane) and the Victoria General Hospital. In his report for 1929, Dr. Lawlor indicates that 263 patients were admitted to the Nova Scotia Hospital during the year. The daily average number of patients in residence was 415. Based on admissions, the recovery rate was 45 per cent. Dr. Lawlor reports the installation of an x-ray equipment, renovation of several wards, and important improvements in sanitary sections. The cost of maintaining the hospital for the year was \$248,544.00.

At the Victoria General Hospital, Mr. Kenney, the Superintendent, reports 4,979 admissions, and a daily average of 213 patients in residence. In the surgical department, 1,672 operations were performed; in the gynaecological department, 338; in the eye, ear, nose

and throat department, 742. Ambulance calls numbered 1,087. In the laboratory, 9,622 specimens were examined. In the x-ray department 4,826 examinations were made and 1992 treatments administered. The expenditure for the year was \$291,347.45.

Plans for the 77th annual meeting of the Medical Society of Nova Scotia are now well advanced. The meeting is to be held at the New Pines, Digby, on the first three days of July. The New Pines is a very modern and finely appointed hostelry, and will be reserved in its entirety for this meeting of the Society. In addition to papers by members of the Bluenose profession, addresses are promised by Dr. T. W. Harmer, of Boston, Dr. A. T. Bazin, and Dr. J. R. Goodall, of Montreal, Dr. Ross Millar, of Ottawa, and Dr. G. H. Agnew, of Toronto. On the evening of the second day, the dinner will be held and Dr. E. O. Hallett, of Weymouth, will deliver his presidential address. A golf tournament is being arranged, and abundance of other recreation will be provided.

The report of the Department of the Public Health, presented at the last session of the Nova Scotia Legislature, contains much that is of interest. Dr. G. A. MacIntosh, until recently the Provincial Health Officer, refers to a limited outbreak of small-pox, numbering 24 cases, of a severe type but without fatalities. The infection came from without the province. Influenza was prevalent for some months and caused 180 deaths. Trichinosis developed among foreign-born people in one of the mining towns but was quickly controlled. Only eight cases of poliomyelitis were reported. Scarlet fever was unusually prevalent, but was of a mild type. Dr. MacIntosh deals at some length with the control of tuberculosis, urging that the home should be the great battle-ground in the fight against the disease. He also writes favourably of the county health unit idea. During the year only one Divisional Health Officer was attached to the Department. Much of his time was devoted to the control of tuberculosis, in which particular he made 1,404 chest examinations. In the counties in which public health nurses are employed, 94,626 school pupils were examined, of whom 6,824 were found to have one or more defects. A total of 3,679 such children received treatment. In the laboratory, 12,198 specimens of various kinds were examined. The vital statistics for 1928 show a general death rate of 11.8. The infant mortality rate was 79.1. Of a total of 865 infant deaths, 310 occurred in those less than a week old. The death rate of pulmonary tuberculosis was 91.2; that of all forms of tuberculosis, 109.0.

Dr. M. D. Morrison, of Halifax, has been elected president, and Dr. M. A. B. Smith, of Dartmouth, has been elected a vice-president, of the Nova Scotia Historical Society.

Dr. J. W. MacLean has been re-elected president of the North Sydney Institute of the British Seamen's Society.

Dr. T. B. Acker, of Halifax, was recently presented by Her Excellency Lady Willingdon with the badge of honorary membership in the Canadian Red Cross Society, in recognition of the assistance he has given to Red Cross clinics for crippled children.

W. H. HATTIE

NEW BRUNSWICK

The graduating class of nurses at the Chipman Memorial Hospital, Saint Stephen, for this year, was the largest on record, twelve nurses graduating at the exercises held on May 1st. The chief speaker of the evening was Dr. H. S. Everett, of Saint Stephen, who gave the address to the graduating class.

Dr. V. D. Davidson and Dr. L. DeV. Chipman were chosen as a visiting lecture-team from New Brunswick to address the Halifax Medical Society. The visiting doctors report a wonderful reception in Halifax. The meeting will no doubt be reported elsewhere.

The extra-mural lectures for April, in New Brunswick, were given by local speakers Drs. V. D. Davidson and R. A. Hughes, of Saint John. Dr. Davidson spoke of the treatment of fractures of the spine, paying special attention to fractures of the body of the vertebrae.

He presented a large number of completed cases from his own service and from the general service of the Saint John General Public Hospital. Emphasis was laid on the necessity for long immobilization in all cases of injury to the body of the vertebra. This viewpoint has been generously met by the Compensation Board in New Brunswick who allow at least one year's compensation and treatment in spinal injuries.

Dr. R. A. Hughes took as his subject "Sinus Disease". He emphasized post-nasal drainage from diseased sinuses as a fertile cause of disease in the chest. The presence of obstruction in the nose was the second point of interest. The removal of any obstruction was held to be essential to the clearing up of sinus

infection. Dr. Hughes reported a considerable number of cases all from his own service.

These two doctors spoke at Saint Stephen, Fredericton, Moncton, and Saint John. At all of these places, large audiences were pleased with the presentation offered. The local society expressed their desire for more medical subjects in the extra-mural courses.

The demolition of the old building of the General Public Hospital, in Saint John, is now completed, and excavation for a new foundation is being carried forward rapidly. The hospital, which has long been a land mark on Hospital Hill, will shortly be replaced by a magnificent new building which it is hoped to complete in 1931.

The Provincial Department of Health has instructed Dr. C. W. MacMillan, of the Tuberculosis Branch, to make a canvass of Saint John and vicinity along tuberculosis lines from a public health standpoint. The reception extended to Dr. MacMillan in Saint John has been cordial and it is expected that his services will be much in demand.

Dr. W. A. Ferguson, of Moncton, left recently for a two months' trip to Europe.

Dr. C. M. Kelly, of Saint John, is at present in New York, doing his annual month of research work.

Dr. G. A. B. Addy has returned from a considerable tour in the Southern United States and is once more busily engaged in surgical practice.

A. STANLEY KIRKLAND

QUEBEC

We have much pleasure in calling the attention of the profession to Lovat Hall, the sanitarium recently opened for the treatment of cases of nervous and mental disease by Dr. A. G. Morphy, who for many years has been connected with the departments of Neurology and Psychiatry in McGill University.

An old estate beautifully situated on the highway between Toronto and Montreal, in the neighbourhood of the town of Lancaster, has been obtained. The old manor house standing well back from the road at the end of a long avenue of elms and maples, while retaining outwardly a very home-like appearance, has had its interior completely remodelled to fulfil all the demands of a modern first-class sanitarium. It is surrounded by many acres of lawn, gardens, and orchards, more or less enclosed by cedar hedges of exceptional height and beauty.

A large solarium has been built, commanding a magnificent view of Lake St. Francis with the Adirondacks in the distance. In its construction "vita" glass has been used in all parts where the special power of the glass could be of distinct service. A complete hydrotherapeutic equipment has been installed. All furnishings and decorations have been planned to secure the best artistic effect, and the colours have been chosen to be quietly harmonious and pleasing to the eye. The nursing staff is under the charge of Miss Bliss, who has had special training for the nursing of this form of disease. The Sanitarium can be commended as a well equipped institute, standing in beautiful grounds, under careful and able supervision.

The City Council of Montreal is to be congratulated on its determination to lose neither time nor effort in getting the Board of Health into working harness. Under the by-law the nine members of the Board are appointed for two years from May 1st, following each civic election, and the Board was named on the earliest possible legal day. With the exception of the chairman, who presides at present on account of his official position as chairman of the Executive Committee, all the members of the Board are qualified physicians, and the fact that they are willing to devote their time and talents without remuneration shows their interest in the cause of Public Health. It is indeed only through the medical profession that any amelioration of health conditions can be obtained. A change will be made in the by-law whereby the chairman of the Executive will not be a member, and he will be replaced by another alderman. The board as now constituted consists of Ald. Allan Bray, chairman; Ald. Dr. Fred. Gilday, Ald. Dr. Zenon Lesage and Ald. Dr. H. Quintal; Dr. S. Boucher, director of public health; all representing the City of Montreal. For McGill University, Dr. A. Grant Fleming and Dr. F. J. Pedley, and for Montreal University, Dr. L. de L. Harwood and Dr. E. G. Asselin are re-appointed.

The Board of Health is a strong body, appointed without wire-pulling and without favour. It will have the services of the leading men of the profession and much is expected by the citizens from its handling of the problems that will be brought before it.

The need for an educational campaign devoted to the origin and cure of tuberculosis was emphasized at a

recent meeting of the Royal Edward Institute in the report submitted by Dr. E. S. Harding, honorary secretary. The report said that the institute was severely handicapped by the lack of beds in the district, both for curable and incurable cases. There had been 1,013 deaths in the city in 1929 due to pulmonary tuberculosis and of the patients who died only 277 had attended institutes, the Royal Edward Institute dealing with 125.

Moreover of these cases, the report continued, 14 were reported within a year, and 37 within six months, of death. These figures showed that many cases were hopeless when reported to the institute and "until this is rectified very little can be done to stamp out tuberculosis in the city."

Attention was again drawn to the fact that because it is necessary for a foreigner to reside in the country for five years before he is eligible for provincial aid there is no fund available for his treatment and he often works too long after diagnosis, then spends all his savings on treatment and eventually finds his way to an institution where it is too late to do anything with him except give him a bed in which to die.

This in addition to the fact that there are insufficient beds available led to the result that of the 95 deaths reported to the institute only 15 had received sanatorium care. It was suggested that the dispensaries should come into closer touch with the private physicians in all suspected cases and that greater knowledge of the disease and its incidence should be disseminated.

The difficulty of the treatment of aliens for the reason mentioned was again stressed in the report of the social service and visiting staff which dealt with the results of the supervision of 1,890 families during the year. The report, which was given by Miss M. L. MacDermot, supervisor, said that when aliens have not been long enough resident in the province to be treated at the public expense and deportation to their native land was proposed, the patients frequently disappear only to return when in the last stages of the disease. "Again and again", it added, "we find some patient who cannot go under the Quebec Charity Act pays for his own cure until his funds are exhausted and then has to return to work, or the bread-winner cannot leave his family to get along alone and so the good which was begun in many cases, is wiped out."

The summary of the report states that 9,840 consultations were given during the year and 2,818 patients attended, of whom 1,333 were new. The nurses' visits numbered 12,633.

The meeting, which was under the chairmanship of Louis S. Colwell, approved of the directors' recommendation to sell the property to the Canadian National Railways for \$160,000, the site being needed for the new terminal station. Mr. Colwell said that the directors had been in consultation with a committee of tuberculosis specialists together with Dr. Boucher, chairman of the City Health Department, as to the future of the institute. They had called in Dr. F. W. Walker of the American Health Association, New York, as an advisor and would report on the matter as soon as possible. He paid tribute to the excellence of the work done by the staff and to their loyalty.

It is hoped that the new Mount Sinai Sanitarium, equipped with 10 beds, will be opened at Ste. Agathe some time during July.

The tuberculous poor of the Jewish community will find greatly improved hospitalization, such as x-ray quartz lamps, sterilization rooms, dental rooms, a vault for storing x-ray films, radio connections near every bed, separate wards for the incipient cases and for the very sick, a roof garden for sun baths, sun porches, and a synagogue. It is also aimed to provide a dispensary for the use of residents of the surrounding district.

The Provincial Government has contributed \$150,000 toward the building.

During the past year some 127 cases were treated

at the Mount Sinai Sanitarium, and of these 51 were discharged with their condition more or less improved.

Reports submitted to the general annual meeting of the Notre Dame Hospital showed the great amount of work accomplished during the year 1929 by the staff of the institution and the generous support given to it. Satisfaction was expressed by Dr. L. de Lotbiniere-Harwood, chairman of the board of administrators, at the excellent conditions at the close of the year. The assurance was given that, in spite of the fact that the construction of the new east wing of the hospital would entail an expenditure of \$1,500,000, work would be started immediately, thanks to the promise of financial support given by friends of the institution to a special committee in charge of the public subscriptions and by E. R. Decary. Dr. Harwood also remarked that this meeting coincided with the fiftieth anniversary of the foundation of the institution and he expressed the hope that a fitting celebration would be held to commemorate the occasion.

Dr. Arthur Lessard, superintendent, in his annual report, announced that during the year a total of 5,946 patients were admitted to the hospital, staying there a total of 96,591 days, or an average of 16 days each. The public dispensary reported a total of 81,366 consultations, an increase of 20,000 over the preceding year. The superintendent added that thousands of patients had to be refused because of lack of space, which explained the urgency for the construction of a new wing with a capacity of 216 beds.

In his financial report, Joseph B. de Boucherville, who replaces Tancrede Bienvenue, honorary treasurer, temporarily, showed that the hospital had assets of \$2,792,320, and had been in a position to meet all its expenses. At the end of the year, there had been a deficit of more than \$28,000, but it had been covered by the extraordinary revenue, amounting to more than \$41,000. During the same year, the hospital had received the benefit of a new trust fund created by the estate of the late Mrs. Paul Lussier, to the amount of \$100,000.

In his annual report, Dr. Arthur Lessard stated that the number of surgical operations during the year 1929 was 4,386, an increase of 206 over the preceding year; of the 5,946 patients treated, 5,733 were released before the end of the year, and of these, 5,035 were cured or in a fair way to a complete cure. In the surgical department, the gross rate of death was only 5.6 per cent, while the net rate was 4.06 per cent.

In the public dispensary, the number of patients treated was 81,366, an increase of 24,000 over the preceding year, and an average of 200 patients a day. The number of surgical operations in this department was 4,912, an increase of 1,800. The ambulances answered 1,576 calls. Thousands of patients were treated in the workmen accidents clinic and in the x-ray department. The resident staff is composed of a chaplain, 40 nuns, 19 doctors, 110 nurses and 116 men and women employees.

At the St. Paul Hospital, operated by Notre Dame, which is reserved for contagious diseases, 1,323 patients were treated in 1929, representing a total of 41,921 days in hospital. The number of beds was 115 and 1,161 patients were released cured, 107 were still under treatment at the end of the year, and 53 died of whom 29 were dying when brought to the institution. The death rate was only 4 per cent gross, but if subtracting from the list of deaths those deaths which occurred within 48 hours of the admission of the patient to the hospital, the rate falls to 2 per cent. The St. Paul ambulance answered 943 calls during the year. The patients treated at both hospitals were of all races and creeds, though a great majority were French-Canadians and Catholics.

The Federation of French Health Agencies which includes such social organizations as the Assistance Maternelle (Mother's Aid), the school of public health nursing, the child welfare federation (parish baby consultations), the summer camps for boys and girls, recently held a financial campaign. The objective was \$150,000, to be divided among the five agencies.

The School of public health nursing has for its object the training of graduate nurses. During 1929, 17,196 visits were made to homes, 350 consultations given free, 5,275 individuals visited, in the area visited, infant mortality was reduced by 33 per cent, and gastro-enteritis by 45 per cent.

The summer camps for boys, in 1929, which numbered seven, were equipped with 13 large buildings, which had a registration of 935, and 19,635 days being spent in the country, and 72,000 meals given. The Jeanne d'Arc camp for girls accomplishes the same work as the boys' camps, and had a registration of 210 in 1929, 4,410 days being spent in the country, and 13,230 meals given.

The city of Montreal will contribute 40 per cent of the total cost of the new Bruchesi Institute which is to be built at a price of \$1,600,000, it was decided by the Executive Committee. The Provincial Government will provide the other 60 per cent, which makes the division \$640,000 by the city and \$960,000 by the province. With interest, this will mean an annual outlay for the city of from \$50,000 to \$55,000, depending on the rate of interest prevailing for 20 years. In return the city and province will obtain 300 free beds in the institution out of a total of 400, the balance of 100 being paid beds.

This decision was arrived at following a plea made for civic aid by a delegation representing the institution and composed of Dr. J. E. Dubé, vice-president; Dr. J. A. Jarry, medical director, and T. O. Trudeau, treasurer, of the institution. The institute made a similar plea to the former executive and was told that when the Provincial Government consented to aid

the city would follow. In the meantime the Provincial Government has adopted an Order-in-Council authorizing the grant of 60 per cent of the total cost.

The Executive immediately approved the city's participation in the project.

Dr. Dubé pointed out that there was a lamentable dearth of beds for tuberculous patients in this Province and that in Montreal district alone there was a deficiency of at least 1,200 beds now. Ontario had at its disposal one bed per death per annum, a normal number, but whereas there were 2,000 deaths a year in this district there were but 650 beds.

With the assurance of both the provincial and civic administrations that the money would be available the institution will immediately commence its work of building the new sanatorium.

Dr. Alphonse Lessard, director of the Provincial Health Board, when presenting diplomas to a number of new nurses at the Sacred Heart Hospital, Cartierville, on May 5th, stated that the Provincial Government would continue and increase its campaign against tuberculosis, by creating preventoriums, hospitals and dispensaries wherever necessary.

Dr. Lessard stressed the importance of the work accomplished by the Provincial Government in its fight against the white plague. Four years ago, the province had only 400 beds reserved for victims of tuberculosis; to-day it has 1,400, and the number is increasing rapidly. In the Government's dispensaries, some 30,000 patients were treated last year. Dr. Lessard predicted that within a short time Quebec would have 3,000 beds for those suffering from tuberculosis.

Two appointments of particular interest to Montreal were made by the Provincial Cabinet during the course of its last meeting, these being the naming of Dr. F. M. A. McNaughton to be medical health officer for Westmount, and Dr. Louis Trudeau in a similar capacity for the municipality of Longueuil.

ONTARIO

The private pavilion of the Toronto General Hospital was formally opened on April 23, 1930, by Lieutenant-Governor Ross. A special key made for the occasion was used and the building is now open for public service. This building and the new Banting Institute on College Street complete the extensive additions which have been made to the Toronto General Hospital, additions made necessary by the ever growing demand for hospital accommodation. The most up-to-date equipment has been installed in the new building, and as it stands to-day it is probably the largest hospital unit in the Dominion. Special addresses were made by Canon Cody and by Mayor Wemp, after which the

building was opened for general inspection. The old private pavilion, which for some 17 years has seemed sufficient for Toronto's needs becomes now part of the nurses' residence. The new pavilion offers accommodation for more than 300 patients, nearly double that of the old.

The nominations at the Academy of Medicine are as follows: Dr. D. King Smith, *President*; Dr. Harris McPhedran, *Vice-president*; Dr. Brefney O'Reilly, *Hon. Treasurer*; Dr. Penticost, *Hon. Secretary*.

Members of the council were nominated and elected.
N. B. GWYN

MANITOBA

At the Seventh Labour Women's Social and Economic Conference of Canada, held in Winnipeg, many topics affecting medicine were discussed. Placing of hospital, medical and dental services under state control; the establishment of a federal system of pensions for the blind; appointment of a medical board with power to sterilize those whose offspring would, in their opinion, be a detriment to society; opposition to compulsory vaccination or inoculation; establishment of birth control clinics in connection with hospitals presided over by medical authorities; and alteration of the criminal code

of Canada so that circulation through the mail of literature dealing with family regulation may become legal; were subjects of resolutions adopted at the meeting.

Dr. H. M. Speechly, of Winnipeg, in a paper on family limitation stated that birth control was a phase of the new adjustment taking place as a result of the new intellectual and economic status of women. As a measure to safeguard children being born into conditions under which they would not have an opportunity to develop into normal healthy human beings it was justifiable. He expressed the belief that provision should be

made for reliable information and advice to mothers on this subject.

Mrs. Jean McWilliams, of Calgary, in a paper on

public health pleaded for more education against useless surgery which she maintained was being commercialized by the medical profession.

SASKATCHEWAN

The proposed schedule of fees for the Saskatchewan Workmen's Compensation Board was discussed at a special meeting of the Regina and District Medical Society. The fees proposed are about two-thirds of the minimum of the schedule of fees of the Saskatchewan Medical Association. It was the opinion of the meeting that the provincial medical society should ask the Compensation Board to readjust the fees to correspond to those of the provincial schedule.

At the monthly meeting of the staff of the Regina General Hospital Dr. W. E. Coles, Medical Health officer, asked the staff to consider the question of fees for treating the city indigents. In the past no bills have been rendered by the doctors, but recently several bills had been sent in. The city has set aside \$27,000 for the medical care of the poor. This is paid to the hospital. If the doctors continue to send in accounts for the treatment of these cases the city will make arrangements with the medical health officer or his assistant to look after these people. Some brisk discussion followed this announcement. One member said that people have begun to think that medical treatment is one thing that should be had for nothing. Whose fault is it, he asked, that people are thinking this way? A committee of three was appointed to meet the city council and discuss the matter.

Care of the indigent sick is still the most unsettled question in medical circles. On January 21, 1930, the executive of the Saskatchewan Medical Association and the Council of the College of Physicians and Surgeons met the executive of the Saskatchewan Rural Municipalities Association in Regina, to discuss the question of the payment for treatment of indigent cases. Representatives of the Executive of the United Farmers of Canada, Saskatchewan Section, were also present. The matter was thoroughly reviewed.

Later the Executive of the Saskatchewan Medical Association and the Council of the College of the Physicians and Surgeons passed the following resolution:

"That we agree to recommend to the profession to accept 70 per cent of the minimum of our schedule of fees for the treatment of indigent sick. It is understood that this be subject to revision by the Saskatchewan Medical Association at its next annual meeting."

It was also agreed that a copy of the schedule of fees be sent to the secretary of the Rural Municipalities Association, and it was agreed also that if any further discussion were necessary on this question the discussion should take place between the Executive of the Rural Municipalities Association and the Executive of the Saskatchewan Medical Association.

The above decision was sent to the Rural Municipalities Association but no reply was received. The Medical Association has been informed that the solicitor for that body has advised that if a municipality makes an agreement with a hospital and a particular doctor, this will comply with the law and they will not be obliged to pay for the care and treatment of the indigent sick who go to a different hospital or to a different doctor. At present the various municipalities are endeavouring to make arrangements with individual doctors and hospitals to take care of their indigent sick.

The Executive of the Saskatchewan Medical Association is of the opinion that it is in the interest of the profession and of the public that the patient should have free choice of doctor. They have again earnestly requested the members of the Saskatchewan Medical Association not to enter into any contract with a municipality, for in matters of this kind the profession should act as a whole.

The Rural Municipalities Act which covers the care of indigents is as follows: "The Council of every municipality shall make due provision for the care and treatment of any person who has been a resident of the municipality for at least thirty days, who falls ill, and who is financially incapable of procuring the necessary medical attendance and treatment."

Two rural municipalities have published notices in the press signifying that they have entered into agreements with individual doctors for the treatment of their indigents and repudiate all liability for the payment of the costs of medical services rendered by other than the medical officers mentioned in the notices.

This question will be thoroughly discussed at a special meeting of the Saskatchewan Medical Association, to be held in Regina in June.

Dr. G. Paulson, who has been associated with Dr. Arthur Rose at Hafford, for more than a year and a half, is now in private practice at Cutknife.

Dr. L. A. C. Pantou, of North Battleford, is mayor of that town.

Mr. T. B. Macaulay of the Sun Life Insurance Company presented a Burdick Quartz Lamp to the Hafford Hospital, which has been of untold value this winter.

The Regina and District Medical Society is looking forward to entertaining the delegates to the Canadian Nurses' Association at a joint luncheon in June.

LILLIAN A. CHASE

ALBERTA

The Central Alberta Medical Society was recently organized at Stettler. Members of this new-formed organization will include physicians practising in towns as far as one hundred and fifty miles east along the Lacombe branch of the railway.

The following officers were elected: *President*, Dr. C. A. Staples, Stettler; *Vice-President*, Dr. A. H. Meneely, Coronation; *Secretary-Treasurer*, Dr. M. W. Connelley, Stettler. This Society has requested the

Provincial Government to make some provision for the testing of cows for the presence of tuberculosis, as there are no veterinarians in the district.

Dr. Percy Sprague, of Calgary, has received a Fellowship in Medicine at the Mayo Foundation, Rochester, Minn. He graduated from the University of Alberta in 1927, then spent a year in pathological work and two years in general practice.

During the past year the provincial government engaged three women physicians from Great Britain, and for their services paid each one \$2,100.00. The district in which each is practising provided a house as well as transportation on out of town cases. These women were well trained yet received twenty-five dollars a month less than the district nurses, which seems like an anomaly, as well as an absurdity. These women are at the following points, Lac La Biche, Kinuso (on Lesser Slave Lake), and Notikewin (about fifty miles north of the town of Peace River and as far from train service). The people in these districts are taking advantage of these physicians by asking unreasonable work. Recently one was called to make a trip of thirty miles on a Sunday afternoon to see a man who had had some form of rheumatism for several weeks and was in no worse condition. Family vaccinations are also requested on Sunday afternoons, and the people complain if immediate trips are not made.

The Council of the College of Physicians and Surgeons has agreed on behalf of the profession that the rural school children may have examination similar to those made of city children at the expense of the rural school boards, on the following basis, *viz.*: one dollar per mile as mileage, and in addition five dollars for each school of ten children or less, with an additional charge of fifty cents for each pupil over ten years of age. Where two or more schools are examined on one day the mileage is to be divided among the schools. The School Act provides that trustees may apply funds to the extent of having all the children examined, but as it is not compulsory, most of the rural school trustees have not so far acted. The United Farmers of Alberta have requested the government to make such examinations compulsory wherever a physician is available.

At the annual meeting of the Calgary Medical Society, held early in May, Dr. J. W. Clay gave a very interesting address on "The treatment of focal infection in the teeth." At this meeting the following officers were elected for 1930-1931: *President*, Dr. R. G. Williams; *Vice-president*, Dr. W. H. McFarlane; *Treasurer*, Dr. H. N. Jennings; *Secretary*, Dr. A. Fettes; *Executive Committee*, Drs. A. H. Baker, M. C. Salmon, and A. W. Scott.

The Public Health Department expenditures in this province were for the departmental year 1928-1929, \$1,369,081.36.

Estimates for 1929-1930.....\$1,418,840.00

Estimates for 1930-1931..... 1,597,671.15

Grant to the University Hospital, Edmonton, for 1930-1931, \$20,000.00. (This has averaged this amount during the past three years).

The "travelling clinic" appropriation for 1929-1930 was \$36,624.00, but during this period there was actually expended \$39,261.07.

Appropriated for 1930-1931, \$41,750.00.

The following report was recently issued by the Provincial Department of Health on deaths from external causes:

	Year 1926	Year 1927	Since year 1918 to 1927 incl.
Suicides	65	71	585
Poisoning by food	7	7	36
Fires	14	12	123
Burns	19	33	285
Drownings	46	56	448
Firearms	15	23	236
By animals	19	15	167
Fall	35	40	299
Railroads	18	26	142
Autos	22	35	168
Sundry	243
Total for 10 years.....			4,003

Death rate per age	Year 1927	Percentage of total
0 - 9	1627 or	30
10 - 19	309 "	6.1
20 - 29	344 "	6.8
30 - 39	388 "	7.6
40 - 49	458 "	9.0
50 - 59	518 "	10.2
60 - 69	633 "	12.5
70 - 79	523 "	10.3
80	263 "	5.16

The following list shows the number of graduates in medicine in the University of Alberta since degrees were first granted in this institution:—

First graduating class in 1925	11
Total number of graduates to date	80
Average per year	16
Total vacancies at the present time in practice	30

G. E. LEARMONTH

BRITISH COLUMBIA

The recent session of the Legislature of British Columbia was asked to consider legislation of deep concern to the profession and to the general public. It had been felt by the profession for some time that the members of the regular and legally qualified profession should possess some title distinguishing them from those who come into the country, without qualifications of any sort, and assume the title of "doctor". An amendment therefore, to the Medical Act was introduced, in line with similar legislation recently passed by the Province of Ontario, confining the legal right to use the title "doctor" to those legally qualified. The amendment was bitterly fought by those opposed to the regular profession, but ultimately passed without a dissenting voice, and is now the law of the province.

During the session, Bills were brought before the House which had for their object the legal recognition of Drugless Healers and Chiropractors.

Since the year 1920 almost every session of the

legislature of this province has had to deal with a demand from some healing cult for legal recognition. These demands have always had behind them a certain limited public support not large, but very vocal, which is apparently based upon the theory that the regular medical profession which practises under the Medical Act of the province seeks to deny to all others the opportunity of healing the sick. A large portion of the general public seem to believe that a Medical Act is enacted entirely in the interests of the profession, overlooking the real fact that all such legislation is for the protection of the public rather than in the interests of any particular group of practitioners. All that the medical profession has endeavoured to insist upon is that before anyone should be allowed to treat the sick, he or she should be made to show, before some competent body, that he or she is able to recognize disease—surely a reasonable demand. Can it be argued that before anyone should receive the legal right from a legislature to

treat the sick that he or she should not be able to demonstrate his or her knowledge of the fundamental subjects, such as anatomy, physiology, and pathology? Surely these fundamental requirements are more in the interests of the general public than those of any particular group. When such competency has been shown, and only then, a legislature might reasonably concede the granting of legal recognition. This question has been exhaustively inquired into since 1920 by special committees of the legislature, and the principle laid down has always been upheld, that before legal recognition can be granted a certain safe standard of education in fundamental subjects, before a competent body, must be shown. Is there anyone who denies the reasonableness of that principle?

As a result of the struggle on behalf of this principle during the past few years in the Province of British Columbia, the Medical Act has been amended and machinery provided for the examination of these various cults and a standard examination laid down, but up to the present time not a single candidate has applied. It has been objected that such examining boards contain medical men. The regular profession in this province has no desire to participate in these examinations, but what has been insisted upon is that such an examination should be conducted by competent men who themselves know the subjects, and not by those who, possessing little or no knowledge of these subjects themselves, are obviously unfit to examine others.

The Bills brought in during the recent session by the Drugless Healers and Chiropractors were particularly dangerous, in that they provided for an examining board composed entirely of their own members, and further provided that every member of these cults who had been in practice in British Columbia prior to 1927 should be given legal recognition without any examination whatever; so that the suggestion was that the legislature actually provide for the qualifying of men without examination who for several years had been defying the laws of the province, and had never shown before a board recognized in British Columbia any competency whatever. The danger to the public safety and to the advancement of the public health that the granting of such legislation would mean can well be left to the imagination, and would have aimed a serious blow at the educational standards of our country.

In this province and all over the Dominion we are spending huge sums of money for higher education. Before our sons and daughters can even enter the study of the regular profession of medicine they must possess a high standard of preliminary education. Following that, the medical course itself takes from five to seven years in any of our Canadian universities, and this is usually followed by from one to two years' hospital work, so that it is from five to ten years before a young man or woman is considered fit to be entitled to legal recognition, and it is agreed that this length of time is none too great for the tremendous responsibility involved. It is difficult, therefore, to understand the

apparent willingness of certain legislative bodies to drag down this high standard of modern education, apparently without any adequate realization of what it must mean to the great question of the public health, and to give legal recognition to those who have few or no qualifications, who come to us with little or no preliminary education, and, moreover, not from our Canadian universities but very largely from unrecognized institutions and so-called schools of the United States of America.

One reason advanced by these cults during the struggle for the granting of such recognition, was that they had received it from certain other provinces. We are unable to agree that if a thing is wrong it could be made right because recognized elsewhere. It is gratifying to be able to report that both these Bills were defeated and the attempt made to break down the educational standards of the province has again, for the time being, failed.

A valuable suggestion was made by a member during the debate, that during the summer the whole question of the legal recognition of Drugless Healers, Chiropractors, and other Healing Cults, should be referred to a judicial commission, to report to the next session of the legislature. This suggestion is welcomed by the profession because it means referring this subject to an educated tribunal for final disposal.

A. P. PROCTER,
Registrar

The Council of the College of
Physicians and Surgeons of
British Columbia.

A pioneer physician of the west, who has been practising continuously for fifty years, Dr. Andrew Henderson, of Powell River, was honoured recently by his fellow graduates in medicine from McGill University, at the Vancouver Club. As a tribute to his work and career he was presented with a portrait of himself, painted by Mr. Victor Long of this city.

Dr. C. P. Covernton, president of the Vancouver McGill Alumni Association, presided at the dinner and made the presentation. Following this, representatives of the medical alumni of other Canadian universities paid their tribute to Dr. Henderson's work and career. Dr. Brodie spoke for Toronto medical men, Dr. W. Coy for Queen's University, Dr. J. Scott Conklin for Manitoba and Dr. D. M. MacKay for Dalhousie University.

An intimate friend and confrère of Sir William Osler, Dr. Henderson graduated in 1880. Shortly after leaving the university he went to Calgary where he was one of the first permanent physicians serving the Canadian Pacific Railway. Later he moved to St. Paul and practised there for seventeen years.

Dr. Henderson taught clinical medicine at the University of Minnesota for some time and when Powell River was founded he went there as resident physician and surgeon.

C. H. BASTIN

UNITED STATES

A Post-graduate Week of Physical Therapy To be Conducted by the American Congress of Physical Therapy

Announcement is made of "A Post-graduate Week of Physical Therapy" in conjunction with the ninth annual scientific session of the American Congress of Physical Therapy, to be conducted on September 8th to 12th, inclusive, 1930, at the New Hotel Jefferson, St. Louis, Mo.

An intensive post-graduate week of physical therapy is promised. Elaborate plans have been perfected for teaching, demonstrations and clinics. The

physician who is interested in physical therapeutics and who has not had any instruction in the work will find the lectures on the fundamentals a sound basic means for further study. The more experienced, on the other hand, will gain considerably from the advanced expositions on light, heat, electricity, massage and all the other physical agents utilized in practice. Every phase of physical therapy will be covered. The subjects will be general and specific and so varied as to appeal to both the general practitioner and the specialist.

As has been the practice in the past, sectional

gatherings will prevail in Medicine, Surgery, and Eye, Ear, Nose and Throat. Several of the afternoons and evenings will be given over to addresses by prominent guests. There will be symposia on "Education and the teaching of physical therapeutics" and on "The relation of the physician and the technician in office and hospital practice."

Full information and details may be obtained from The Executive Secretary, American Congress of Physical Therapy, Suite 716, 30 N. Michigan Avenue, Chicago, Ill.

The American Association for the Study of Goitre

The annual meeting of the American Association for the Study of Goitre will be held on July 10 and 11 at Seattle, Wash., and on July 12 at Tacoma, Wash., and Mount Rainier. A very full and representative program will be presented, there being thirty-four papers to be read. Dr. E. R. Arn, of Dayton, O., is the President; Dr. J. R. Yung, of Terre Haute, Ind., is Corresponding Secretary; and Dr. J. Tate Mason,

of Seattle, Vice-president and Chairman of the Program Committee. Dr. Gordon S. Fahrni, of Winnipeg, who is one of the Executive Councillors, is down for a paper on "The effects of thyroidectomy upon pregnancy."

The American Proctologic Society

The thirty-first Annual Session of this Society will be held in Buffalo, June 22, 23, and 24, 1930. The headquarters will be the Statler Hotel. Dr. Walter A. Fansler, of Minneapolis, is President, and Dr. Curtice Rosser, 710 Medical Arts Building, Dallas, Texas, is Secretary, from the latter of whom all information can be obtained.

Presentation of a Gavel

At the meeting of the Association of American Physicians held in Atlantic City, May 6 and 7, Dr. T. McCrae and Dr. N. B. Gwyn presented a gavel made of a fragment of wood from the house at Bond Head in which Sir Wm. Osler was born in the year 1849.

GENERAL

University of Paris—Faculty of Medicine Post-Graduate Courses

The Dean of the Medical Faculty of the University of Paris, Prof. H. Roger, announces that a post-graduate course in *English* will be given from June 2 to October 28, 1930. The following subjects will be considered:—

Diseases of the lung.—10 conferences and practical demonstrations, with x-ray projections and anatomical specimens—Professor Sergeant—Hôpital de la Charité, (October 20 to 25). Fee, 500 francs.

Diseases of the heart and blood vessels.—10 lessons—Professor Clerc—Hôpital Lariboisière. (October 20 to 30). Fee, 600 fr.

Pediatrics.—2 series of lectures and practical demonstrations—Dr. Armand-Delille—Hôpital Hérold, (June 2 to 17 and October 6 to 18). Fee, 500 fr. for each series.

The surgery of the digestive tract and liver.—With operative demonstrations and operations on the dog—clinic of Professor Gosset—(October 13 to 20). Fee, 500 fr.

The surgery of the eye.—10 lessons—Drs. Morax, Magitot, Bolack, and E. Hartmann—Ampitheatre d'Anatomie des Hôpitaux, (October 1 to 14). Fee, 500 fr.

The surgery of the ear, nose, and throat.—10 lessons—Associate Professor F. Lemaître—Ampitheatre d'Anatomie des Hôpitaux, (October 15 to 28). Fee, 500 fr.

For further information and a detailed program write to the Secretary of L'Association pour le développement des Relations Médicales, Salle Bécard, Faculté de Médecine, 12 rue de L'Ecole-de-Médecine, Paris (6e).

An Epidemic of Trichinosis

An outbreak of trichinosis in Stuttgart, Württemberg, has been traced to bear's ham served to the guests of a restaurant. The ham was that of a polar bear belonging to a small circus which did not prosper and was therefore dissolved. The proprietor of the restaurant bought the bear, which was apparently sound, and put bear's ham on the bill of fare. The meat was very much enjoyed by his clients, but those who had eaten of it complained some time afterwards of severe muscular pain; fever developed and they had to be taken to hospital, where the nature of the disease was eventually ascertained. Eventually more than 70 people were taken ill, and ten of them died,

including the proprietor of the restaurant and his wife. There is some astonishment among the public that it is possible to have such an epidemic of trichinosis, which has almost disappeared in Germany as a result of the careful meat inspection. It is stated, however, that there is a gap in the law, in that game is not liable to examination, and the proprietor of the restaurant was thus within his rights to sell the meat without inspection. According to veterinarians bears often suffer from trichinosis, and though the flesh of these animals is very seldom eaten in this country, meat inspection should be extended to it.

An X-Ray Martyr

Dr. Robert Chaperon has died in Paris after a long illness occasioned by professional exposure to x-rays at the Hôpital Broussais, where he was radiologist and assistant in electroradiology to Dr. Lauby. Two days before his death he was visited by the new Minister of Public Health, accompanied by members of the hospital staff, who conferred on him the gold medal of the Assistance Publique. It is understood that his memory will carry the insignia of the Legion of Honour which was not awarded to him in his lifetime.

Proposed Reform of the Vaccination Laws

The German Federal Health Council in their last meeting have recommended the Government to modify compulsory vaccination. The proposals are that: (1) conscientious objection of the parents should be considered; (2) the number of children to be vaccinated by any particular medical officer should not be too large, in order to allow him to examine them thoroughly to ascertain their constitutional fitness for vaccination; (3) forcible prosecutions by the police to enforce vaccination should be altogether abolished. If a vaccinated child has been injured by vaccination the State should be liable to pay damages. The decision to make these recommendations was taken on the authority of Prof. Schlossmann, the well-known specialist for children's diseases in Düsseldorf. He stated that 28 cases of post-vaccinal encephalitis were recorded in 1928—a number very small compared with the two and a half millions of children vaccinated in the same year. He was also of opinion that without vaccination the number of cases of encephalitis as a sequel to small-pox would certainly be greater. But post-vaccinal encephalitis has afflicted

healthy children and has thus caused much sorrow to their parents. Cow-pox is not a local disease as was formerly believed. He described himself an absolute adherent of vaccination, but without coercion.

The John Phillips Memorial Prize

The American College of Physicians announces the John Phillips Memorial Prize of \$1,500.00, to be awarded for the most meritorious contribution in internal medicine and sciences contributing thereto, under the following conditions: (1) The contribution must be submitted in the form of a thesis or dissertation based upon published or unpublished original work. (2) It must be

mailed to the Executive Secretary of the American College of Physicians, 133, 36th Street, Philadelphia, on or before August 31, 1930. (3) The thesis or dissertation must be in the English language, in triplicate, in typewritten or printed form, and the work upon which it is based must have been done in whole or in part in the United States or Canada. (4) The recipient of the prize would be expected to read the essay at the next annual meeting of the College, after which he would be officially presented with the prize by the President. (5) The College reserves the right to make no award of the prize if a sufficiently meritorious piece of work has not been received. (6) The announcement of the prize winner will be made not later than two months before the annual meeting.

Book Reviews

Treatment in General Practice. Harry Beckman, M.D., Professor of Pharmacology at Marquette University, Milwaukee. 899 pages. Price \$11.00. London & Philadelphia: W. B. Saunders Co. Canadian Agents: McAlinsh & Co. Ltd., Toronto, 1930.

The author of this new work is Professor of Pharmacology at the Marquette University, Milwaukee. He has outlined the treatment of a wide range of diseases met with in general practice, including those found in tropical as well as in temperate zones. To write an acceptable treatise on therapeutics is a difficult task, as it requires not only a good all round experience in the practice of medicine but maturity of judgment tempered with wisdom as well. So often in works of this kind the physician is left in a maze of uncertainty as to which method should be adopted in a given disease, so numerous are the lines of treatment laid down, while old and tried remedies are thrust aside for newer ones which have not had the test of time. Professor Beckman has in considerable measure avoided such pitfalls, though this book is not beyond such criticism. He has, however, succeeded in producing a work which is both useful and practical. The author defends his policy of abstracting in a wholesale manner (in one article, ten pages) from the contributions of men whose opinions are of value on the subjects under discussion. This also is open to criticism. Why he undertook to write this volume and why he has made such free use of the text of articles from current literature, he explains in the preface, wherein he states that "The therapeutic credo of the average young practitioner to-day contains but two articles: one, that there are certain therapeutic principles that invariably hold and that they need to be varied only in detail in the handling of particular diseases; and, the other that the art of treatment is one that 'comes' if only one has mastered the art of diagnosis. It is an attempt to shake, however feebly, the false foundations of these beliefs that the present book has been written. In it each of the principal diseases of man, exclusive of those that by prescriptive right belong within the domain of the legitimate specialties, has had its own peculiar therapy described, as that therapy has been evolved out of the experience of physicians all over the world. The true authors of the book then are those men and women whose names appear in the bibliography. Whenever possible I have presented their work in their own words—always, however, I have looked upon myself merely as an editor and I hope that no more than editorial liberties have been taken in any portion of the book."

Turning to the contents of this book, some of the

articles are too brief, for instance only four pages are devoted to diseases of the respiratory tract, exclusive of pneumonia and gas burns in chemical warfare, and six pages to diseases of the kidneys and nineteen pages to diseases of the nervous system. On the other hand, two hundred and eighty-four pages are taken up with the treatment of infectious diseases, including many of the commoner ones found in the tropics. Under this heading the articles on erysipelas, influenza, pneumonia, and syphilis are of much value and cover the ground thoroughly. Diseases of the gastrointestinal tract occupy sixty-nine pages. The article on gastric and duodenal ulcer is comprehensive and sound, yet is controversial, and in the main consists of abstracts from well-known authorities on the subject. Sixty-four pages are devoted to the treatment of diseases of the circulatory system. This is one of the best outlines of treatment in this volume. The same may be said of the article on diabetes mellitus. Under the caption of Disturbance of the Thyroid Gland thyrotoxicosis is discussed at length and an excellent summary is given of our present-day conceptions and methods of treatment. The treatment of diseases of the blood-forming glands, genito-urinary infectious diseases of the skin, acute poisoning, burns, opium and cocaine addiction, as well as of certain obstetrical and gynaecological lesions, are dealt with. An extensive bibliography covering most of the subjects discussed has been added. This book will probably meet with popular favour as it contains a large amount of sound and useful information. It will undoubtedly be of value to the general practitioner for whom it has been written.

G. E. LEARMONTH

Improved Prophylactic Method in the Treatment of Eclampsia. Prof. W. Stroganoff, Honorary Fellow of the Royal Academy of Medicine in Ireland, etc. 3rd Edition. 154 pages. Price \$3.00. E. & S. Livingstone, Edinburgh, and Macmillan Co. of Canada, Toronto, 1930.

The Stroganoff method in the treatment of eclampsia has been known for years, but the profession as a whole have not been *au fait* with the details of the method.

This authorized English translation of Professor Stroganoff's work, a book of some 154 pages, gives a short review of the method employed in the treatment of eclampsia, a brief history of the subject, and complete details of the "Improved Prophylactic Method." The author cites numerous case reports and comments on individual cases. The rich clinical experience, during the past thirty years, makes Professor Stroganoff's statistical tables, as compared with

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those where other methods were employed, extremely valuable. A bibliography on the "Prophylactic Method" of over 15 pages is appended.

A. D. CAMPBELL

Common Infections of the Female Urethra and Cervix.

Frank Kidd and A. Malcolm Simpson. 197 pages, illustrated. Price \$2.75. London: Oxford University Press, 1929; Canadian Agents: McAinsh & Co. Ltd., Toronto, 1929.

Kidd and Simpson have written a book on the above subject particularly urging the early, frequent, and prolonged treatment of gonorrhœa in the female. The first chapter, which is well written, covers the technique of examination. The second chapter reproduces the written instructions given to patients at the first visit. Chapter three, the Diagnosis and Treatment of Vulvitis, Vaginitis and Bartholinitis, has little of merit apart from the sub-chapter devoted to Bartholinitis. Chapters four and five, on the Diagnosis and Treatment of Urethritis and Cervicitis, are an earnest plea for the active treatment of gonorrhœa affecting these organs and more particularly when this disease is associated with pregnancy. The specific instructions given here make the book worth while. The next chapter on Endometritis, Salpingitis, etc., is very sketchy in character and might well be omitted. The two following chapters, Gonorrhœa in the Female Child, and Gonorrhœal Arthritis, seem to the reviewer to be excellent contributions. Chapter 9, Bacteriology, written by G. T. Weston, might well have been fuller. The chapter on Ophthalmia Neonatorum by Mayou seems out of place; that on, Proctitis, Osteitis and Vaccines is a mixture of no value. Chapter 12 deals with Prophylaxis. Chapter 13, on Recent Advances in Technique, should have been included in the earlier chapters. An appendix follows, covering an analysis of 650 consecutive cases of gonorrhœa in the female.

The book on the whole has merit in that it urges early persistent treatment. The chapters are not well put together. Its value to the practitioner lies in the definite instructions that are given in the handling of acute cases.

J. J. MASON

Radium and Cancer (Curietherapy).

Duncan C. L. FitzWilliams, C.M.G., M.D., Ch.M., F.R.C.S. 170 pages, 8 plates (4 coloured) and 64 illustrations. Price 12/6 net. H. K. Lewis & Co. Ltd., London. W.C.1, 1930.

This small volume consists of a brief and essentially practical presentation of the subject of radium therapy in malignant disease. It is written almost entirely from the personal experience and observation of the author. He points out that with other workers in this field, he is often groping in the dark, and that many of the methods at present adhered to may in the course of time undergo radical change. The rules laid down for treatment are merely given as guides, and must not be regarded as final. This readable little book will be of special interest to beginners and students.

The author has carried out treatment, for the most part, with comparatively small resources of radium, and the book is particularly valuable to those who have access to not more than fifty or a hundred milligrams of radium. As a rule the cancer was treated by insertion of radium element needles directly around and into the tumour, gamma radiation only being utilized. Detailed description of the sizes and strengths of needles used is also given. It is noteworthy that Mr. FitzWilliams prefers to string his needles on wires rather than on threads, which greatly diminishes the danger of loss of needles in the tissues.

The method of choice in the treatment of cancer is stated to be that of prolonged radiation with many weak foci of radium evenly distributed throughout the

tumour. Treated in this way squamous-celled carcinoma is radiosensitive, and the results in cancer of the tongue, mouth, skin, and cervix of the uterus are very encouraging.

Consideration is also given to surface radiation at a distance of about fifteen millimetres, an individual wax mould being prepared for each case. With this method the author has had less experience than with interstitial radiation, as it is only more recently that he has had sufficient radium to obtain adequate dosage by this more extravagant surface treatment. His technique agrees quite closely with that of Cade and Regaud.

Mr. FitzWilliams has come to the conclusion that the primary cancer in the mouth, tongue, tonsil, larynx, lip, skin, vagina, cervix, bladder, prostate, and often in the breast, is best attacked by radium. When possible metastatic glands should be removed by operation after preliminary treatment with radium. After operation radium needles are left in the wound for three days, the threads being brought out through the edges of the wound. Cancer of the stomach, intestine, and rectum are better attacked by an operation, if the case is not too far advanced.

Many instructive cases are reported, and one could wish that even more of these cases had been added. Liberal use is also made of illustrations.

H. L. DAWSON

The Mott Memorial, Contributions to Psychiatry, Neurology and Sociology. Edited by J. R. Lord, C.B.E., M.D. 400 pages illustrated. Price 21/- net. H. K. Lewis & Co., London, 1929.

The various contributions that make up this memorial are of an unusually high standard. They do fitting honour to the memory of Sir Frederick Mott, who was so eminently not only an investigator but also possessed such a thorough knowledge of the pathology of the nervous system, coupled with a mastery of the clinical manifestations of nervous and psychic diseases. It is fitting that, almost without exception, the subjects dealt with, whether anatomical, physiological, psychological, neurological or sociological, were suggested to the various writers by Sir Frederick himself. It is a book that finds a place in the library of the specialist. The general practitioner will find much of interest in many of the articles, but will not find much to help him in his daily routine. It should be noted that although the great majority of the articles are in English, there are, however, German and French contributions written in their respective languages.

Joseph Shaw Bolton in his discussion of "Mental Confusion in Prognosis" elaborates and points out by discussion and reports of history the rôle of mental confusion in prognosis and summarizes by saying, "No mental confusion, no dementia; and this remark has as its necessary corollary the belief that disease of the brain necessitates the appearance of symptoms connoting loss of mind—that dementia indicates the permanent loss of a portion of the cortical neurones which serve as the physical basis of thought."

The mental disorder and its relation to deficient oxidation in brain tissue is ably presented by F. A. Pickworth, B.Sc., M.B., A.I.C., Ph.C., and is of interest to the physico-chemist and to the neurologist. The statement that "the part played by anoxæmia in epilepsy will probably prove to be the leading one" as well as in many other now obscure conditions opens up a comparatively new field in neurology.

The social investigator and worker would do well to peruse the various articles on "Accuracy in Assessment of Alcoholic Morbidity", which still seems very inaccurate and secondly, "The Ætiology of Alcoholism", which too, has not reached a stage of exactness. As stated, we have on the one hand such statements as that of MacCurdy, "The alcoholic is, before



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he even touches a drop, an abnormal person;" on the other hand are those who maintain that alcoholism may arise in a normal man, untroubled by internal conflict, working under the mechanism of habit.

It is impossible to go into detail as to all the contributions. One notes with approval the insistence on the ocular syndrome in the diagnosis of epidemic encephalitis. The studies in blood sugar and mental disorders are of very great interest, but are not developed sufficiently to be of great diagnostic value. The several articles on syphilis of the nervous system are of interest, especially those dealing with general paralysis of the insane.

Lastly, one feels that mention must be made of Sir Frederick Mott and the science of phonetics as it illustrates how Sir Frederick carried even his hobby into the realm of science.

W. MERRITT

Manual of Pharmacology. Walter E. Dixon, M.A., M.D., B.Sc., D.P.H., F.R.S. Sometime Professor of Materia Medica and Pharmacology at King's College, London, etc. Seventh edition. 486 pages, illustrated. Price 18/- net. Edward Arnold & Co., London, 1929.

The present edition of this deservedly popular text-book appears about a quarter of a century after the publication of the first edition. The arrangement of the subject matter has remained practically unchanged, the progress of pharmacology being covered by interpolations in the original text, and also by the addition of new material dealing with the more important advances in our knowledge.

Naturally, the main changes lie in the realm of the organ extracts, the more recent work on the vitamins, for which Prof. Mellanby is probably responsible, and certain of the newer drugs. Reference is also made to helio- and radiotherapy. These additions are of an instructive character.

Some attempt has been made to correlate the findings of the laboratory with those of clinical observation. This feature of the book is worthy of more extended treatment and space might be made for it by the omission of some of the older drugs which still receive a good deal of attention.

The illustrations are numerous, well described, and the printing is satisfactory. The book can be recommended in every way as an excellent epitome of pharmacology.

D. S. LEWIS

Peptic Ulcer. Jacob Buckstein, M.D., *Annals of Roentgenology* Vol. X. 337 pages, illustrated. Price \$12.00. Paul B. Hoeber, New York, 1930.

This volume of the *Annals of Roentgenology*, which is devoted to the diagnosis of peptic ulcer, fills a long vacant space in the library of both the radiologist and the general practitioner. Not since the second edition of Carman's work on gastro-intestinal diagnosis has any serious attempt been made to bring the literature on this subject up to date until the publication of this very fine edition.

In his introduction, the author ably covers the work of early investigators of the gastro-intestinal tract by the use of x-rays. Beginning with the work of Cannon, he passes on to the European experimenters, and has the faculty of stating in a few words the essential facts contributed by various workers in the physiology of the stomach. From this he passes on to the development of the diagnosis of gastric ulcer. Hemmeter's work is outlined and credit given to Reiche for the establishment of the procedure on a sound foundation and one is impressed with the accurate bibliographic records and the fairness shown in giving credit where credit is due to the early investigators.

A lucid description of the radiological manifestations of gastric ulcer is given, both the direct and the indirect evidence being stated in a well worded and concise manner and the valuation of each type of evidence calculated correctly. The relation of benign to malignant ulcer is well handled and we are pleased to see the author accepts Ewing's small percentage of cancerous transformation of benign ulcer rather than the alarming percentages quoted by McCarty. The healing of gastric ulcer is well illustrated and unless one had corroborated this in one's own work, it would appear to be almost impossible. Many case histories are given, all illustrated with x-ray plates, the x-ray diagnosis, clinical history, surgical findings and pathological report being included. This is we feel of inestimable value to the understanding of his method in arising at a correct conclusion. Differential diagnosis between benign ulcer and malignancy is also well discussed and illustrated. This should be of great help in difficult cases.

Duodenal ulcer receives close attention and here again a well ordered account of the early work is given prior to the discussion of x-ray diagnosis of the lesion. Following the text on duodenal ulcer, many illustrations are presented showing in detail the usual deformity of the duodenal caput due to ulcer, and, as in gastric ulcer, cases are quoted stating the radiological findings along with the surgical and pathological reports.

The latter part of the volume is devoted to the rarer conditions of stomal ulcer, subphrenic abscess, ulceration of the oesophagus and gastro-colic fistulae, all these are accompanied by illustrations, demonstrating fully the particular lesion.

It is to be regretted that the negative type of illustration rather than the positive was not used. By the use of the former, one has a better visualization of the lesion and it is the type of illustration the radiologist is more accustomed to. The whole volume from the medical and the publishers' viewpoint is well done and is worthy of a place in the library of any practitioner interested in this important subject.

W. H. DICKSON

Gall-Bladder Disease. David S. Beilin, B.S., M.D., Roentgenologist Augustana Hospital, Chicago, 65 pages, illustrated. Price \$6.00. Bruce Publishing Co., Saint Paul, Minn. 1929.

This volume—one might almost speak of it as a portfolio—is devoted to the question of gall-bladder disease, and its diagnosis by the use of cholecystography.

The author is a protagonist of the oral administration of tetraiodophenolphthalein and minutely describes his technique both in regard to the administration of the dye and the making of the plates. After considering the author's points, one is convinced that the oral method is quite as reliable as the intravenous. From this, the text passes to a description in detail of the points in diagnosis by x-rays of gall-bladder disease, both before and after the advent of cholecystography. Included in this section is a description of the gastro-intestinal manifestations of gall-bladder disease as shown by x-rays.

The remainder of the volume is devoted to illustrations which are indeed splendid examples of x-ray technique. They illustrate the appearance of the normal gall-bladder in cholecystography, before any attempt is made to demonstrate diseased conditions. From this portion it should not be difficult to obtain a general idea of the appearance of a healthy gall-bladder. The abnormal gall-bladder is then illustrated by many plates, improper filling, deformity due to adhesions and gall-stones, each receiving consideration and the value of the various findings is concisely stated.

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This volume should appeal to any medical man attempting to carry out cholecystography. By reference to it he will avoid many of the pitfalls that are strewn in the path of the novice in this type of examination.

W. H. DICKSON

Manual of Determinative Bacteriology. David H. Bergey, with an Index by Robert S. Breed. 589 pages. Price \$6.00. Williams & Wilkins Co., Baltimore, 1930.

This manual has proved its worth in the hands of workers in the various branches of bacteriology, medical as well as general, and the appearance of a third edition much enlarged and improved should be welcome. The scheme of classification adopted, although it may not fall in with all the pet ideas of workers in the different fields covered, which, of course, would be impossible, certainly makes for clarity, inasmuch as very definite characters are chosen to define genera which have been made around type species.

If it be thought that the genera have been made too numerous, this is certainly not a fault from the point of view of facility of identification, as it is much easier to assign an organism to its proper place when we have to deal with a number of clearly defined genera than when we are confronted with larger, more loosely defined, groups.

A case in point, the enormous genus *Bacterium* of other or older classifications, which in any case must be studied as various groups, is in this classification divided into a number of genera which certainly appear to be natural groups, even if, as has been objected by some, they are based on physiological rather than morphological characters.

The introductory chapter being an historical review of the classification of bacteria forms interesting reading, bringing together material which is otherwise difficult of access.

A very valuable addition to the work is the genus and species index which facilitates the finding of species described by other authors under different names.

W. W. BEATTIE

Immunity in Infectious Diseases. A. Besredka, Professor at the Pasteur Institute, Paris. Authorized translation by Herbert Child, M.R.C.S., L.S.A., late Hon. Surgeon French Red Cross. 364 pages, Williams and Wilkins Co., Baltimore, Md., 1930.

For thirty years and more Professor Besredka has maintained from the Pasteur Institute a uniform flow of highly significant contributions to immunology. He recently collected fifteen of these studies, previously published in French journals between 1889 and 1927, and now presents them in book form. The volume constitutes an interesting historical record, but more particularly it demonstrates the evolution of the author's ingenious and suggestive theory of local or tissue immunity and "antivirus" action.

The earlier section stresses the author's strong adherence to the phagocytic thesis and distrust of the whole humoral theory of immunity, culminating in the opinion that the antibodies, except the antitoxins, are unrelated to or are secondary factors in actual immunity. This opinion he bases on the lack of parallelism between antibody content and serum protection, and on the fact that in certain instances the antibodies may be removed by specific absorption without destroying the protective power of the serum. Active immunity, on the contrary, his later experiments lead him to believe, is in essence a cellular phenomenon and depends upon rendering insensitive these cells which are ordinarily sensitive to a particular organism. In the case of anthrax, for example, he finds the skin to be the tissue most susceptible to infection and correspondingly the most responsive tissue to anthrax

vaccine. The guinea pig, previously regarded as refractory to this vaccine, he successfully immunized by vaccinating on the skin. Similarly in the case of staphylococcus and streptococcus infections of the skin and mucous membranes the author presents elaborate and extensive data to indicate that experimental animals may be protected from these infections by previous treatment with sterile culture filtrates of the corresponding organisms applied to the skin in the form of saturated dressings or by intracutaneous injections, and that the spread of these infections in man may be retarded or inhibited by similar treatment. No protection is afforded in animals when similar filtrates are injected intraperitoneally. Intestinal infections, cholera, dysentery and the typhoid fevers, Besredka regards with much supporting experimental evidence as primarily the concern of intestinal mucosa and from this conclusion his well known *per os* vaccination has been developed. Since the intestinal mucosa is the most susceptible tissue he brings the vaccine as directly as possible into contact with it not only by the route of administration but also by the use of a previous or accompanying dose of ox bile in order to remove the layer of mucus from the cells. (English and American work showing less favourable results with the oral administration of bile-typhoid vaccine is not discussed by the author). The object in all these considerations is to alter the susceptibility of the cells or the tissue with which the organism or its products enter into reaction.

The mechanism of the cellular influence Besredka explains as the action of a largely hypothetical "antivirus", a substance which is separated from the growing or dead organism in a culture on which may be liberated in the body following contact of invading organisms with free phagocytes. In other words the "antivirus" is an extract of the bacteria or virus which is non-antigenic. This substance combines readily, he regards, with those cells which are susceptible to infection and perhaps also to toxic action and thereby desensitizes them to subsequent action of the corresponding virus. Such hypothesis is quite obviously similar to the desensitization process in an animal sensitized to anaphylactic shock.

These theories have already stimulated much thought and experimental work, though they probably deserve still more attention than they have received, notwithstanding the fantastic character of some of the explanations and the frequent introduction as evidence of entirely uncontrolled clinical results.

The work is reasonably well documented though there appears to have been a rather large omission of reference to unfavourable results.

G. B. REED

The Immunology of Parasitic Infections. William H. Taliaferro, Ph.D. 414 pages, 26 illustrations. Price \$6.00. The Century Co., New York, 1929.

As prefaced by the author, this book is meant to be a compilation and evaluation of immunological methods with regard to animal parasitism. The immunologist whose work has largely had reference to the usual bacterial infections arising in clinical medicine will find the different serological test tube experiments and intradermal tests are described and carried out with unique antigenic material. He will realize that in the field covered by the author there is an extensive field for investigation and immunological study as well as an enlarged scope for further diagnostic immunological work. The detail of preparing antigens for test tube experiments or for intradermal tests is fully dealt with for each type of protozoa. For the zoologist who lacks an appreciation of the terminology developed by the immunologist who has worked chiefly in problems related directly or indirectly to clinical medicine the detail and interpretation of the tests should aid his experimental endeavours and enlarge his concepts.

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fashion which should be helpful to the general medical practitioner who may be interested in one or other of the topics covered by the title; and there are few in general or special practice whose work will not touch on one or more of the infections dealt with. There are many features which should appeal to the paediatrician, the gastro-enterologist, and as well any who may be especially interested in the subject of allergy from both a clinical and experimental point of view. The book is so well written and interesting that he will, I think, read it all; he will find himself unfamiliar with one or other of the parasites dealt with, will have forgotten the morphology or may never have heard of them, their cycle of reproduction, etc., but will, I believe, to a very considerable extent re-orientate himself through the careful and excellent portrayal effected by the author. There is only one suggestion that the reviewer could make and it is that the book contain more morphological drawings or microphotographs.

In short, the book is a presentation of the author's own field, and is unusually complete in references which should interest many practical and scientific workers.

A. H. W. CAULFEILD

Cours de Chimie Biologique. (Tome II Partie Speciale.) By Pierre Thomas of the Pasteur Institute, Paris. XV and 393 pages, with 12 illustrations. Price 60 francs. Les Presses Universitaires de France, Paris, 1929.

The author is professor of biochemistry in the Faculty of Medicine of the University of Cluj. Pointing out in his preface that plants and animals have many functions in common, he endeavours to present, whenever permissible, the phenomena of animal and plant life as homologous and he deals with them under similarly worded headings. Each chapter contains three parts: (a) theoretical data; (b) laboratory exercises for students; (c) a short bibliography.

Written for the fairly advanced student in biochemistry, this text-book contains many pages that might profitably be read by progressive clinicians and even by expert laboratory workers. The bibliographical references are mostly French and German. A similar book written in the English language, on the other hand, would be rich in English and German references but poor in French. The aloofness between English and French scholars is more apparent than real; ignorance of their respective languages explains what would otherwise be a great tragedy of international medicine. Possibly Canada, with its remarkable intellectual dualism, may some day prove an excellent "agent de liaison."

LÉO E. PARISEAU

Surgery of the Lung and Pleura. H. Morriston Davies, M.Ch. (Cantab), F.R.C.S. (Eng.). 355 pages, illustrated. Price \$7.50. McAlinsh & Co., Ltd., Toronto, 1930.

This is the first of a series of manuals on "Regional Surgery" to be issued by the Oxford University Press. Each will be written by an authority on the special subject dealt with. If the forthcoming volumes should succeed in attaining the high standard of excellence set by this monograph on the surgery of the lung and pleura they will be of exceptional value.

Mr. Morriston Davies is one of the leaders in the realm of thoracic surgery in Great Britain at the present time. He has contributed largely to our knowledge of this subject. He has had a long experience and thorough training in this branch of operative work, especially in the medical and surgical treatment of pulmonary tuberculosis. Hence his opinions carry much weight.

Prior to the great war there were problems in thoracic surgery which had not been fully elucidated or in which advances had not been made *pari passu* with other special branches of surgery. During the war, with the vast amount of clinical material presented for

examination and study, much was accomplished. This gave an added impetus for further research in the post-war period down to the present time. This treatise embodies all the latest advances which have been made and may be said to fill a real need. The text is written in a clear and concise way, and nothing is left to the imagination in dealing with the different lesions which are discussed. The author has drawn on his own large experience, and gives only such methods as are likely to be of the greatest value. Due credit is given the work of American and Canadian surgeons.

The volume is divided into thirteen chapters dealing with the anatomy of the bony framework of the thoracic cavity, as well as the contents of the thoracic cavity itself; physiological considerations pertaining to the movements of the thorax and lungs; diagnosis in relation to the interpretation of physical signs; diseases of the pleura; injuries of the lung and pleura, including gunshot wounds, hernia of lung; diaphragmatic hernia; foreign bodies in the bronchi; abscess of the lung; bronchiectasis; surgical considerations of pulmonary tuberculosis; phrenic nerve evulsion; thoracoplasty; extrapleural pneumolysis; streptothrichosis of the lung and pleura; hydatid cysts of the lung; primary tumours of the lung and mediastinal dermoids. A full bibliography of the subjects under discussion is given. If any chapters might be singled out for special mention, those on diseases of the pleura, abscess of the lung, bronchiectasis and that on the injection and surgical treatment of pulmonary tuberculosis are especially good.

This treatise requires no other words of commendation than those given by Prof. Edward Archibald, of Montreal, in his introduction to this work: "This book is a gospel; the message is a good message—an evangel. It will instruct the declared disciples, and it will bring light to those who as yet see dimly."

G. E. LEARMONTH

BOOKS RECEIVED

Diseases of the Eye. William George Sym, M.D., F.R.C.S.E., Late Ophthalmic Surgeon, Edinburgh Royal Infirmary and Lecturer on Diseases of the Eye in the University of Edinburgh. Third Edition. 71 pages. Price 1/6 net. E. & S. Livingstone, 16 & 17 Teviot Place, Edinburgh.

Bacteriology Applied to Nursing. Jean Broadhurst, Ph.D., Professor Bacteriology, Teachers College, Columbia University, and Leila I. Given, R.N., M.S., Instructor of Bacteriology, School of Nursing, Western Reserve University. 498 pages, 290 illustrations. Price \$3.50. J. B. Lippincott Co., 201 Unity Bldg., Montreal, Philadelphia, and London, 1930.

International Clinics. A quarterly of illustrated clinical lectures and articles on the various specialties. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, and others. Volume I. Fortieth Series, 309 pages, illustrated. J. B. Lippincott Co., Philadelphia, London and Unity Bldg., Montreal, 1930.

Physical and Clinical Diagnosis. Otto Seifert, late professor of medicine, Wuerzburg, and Friedrich Mueller, professor of medicine, II Med. Clinic, Munich. Translated by E. Crowles Andrus, M.D., Associate in Medicine, Johns Hopkins University. 543 pages, 143 illustrations. Price \$6.50. J. B. Lippincott Co., Philadelphia, London and 201 Unity Bldg., Montreal, 1930.

Die Therapie an den Wiener Kliniken. Begrundet von Dr. Ernest Landesmann, gew. Sekundararzt des Wiener Allgemeinen Krankenhauses. 11th edition. Completely revised. Edited by Prof. Alfred Frölich. Price M. 30. Franz Deuticke, Leipzig und Wien, 1930.

Yourself, Inc. Adolph Elwyn, Department of Neurology, Columbia University. 319 pages, illustrated. Price \$3.50. Brentano's, New York, 1930.

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Associate in neuro-psychiatry, Royal Victoria Hospital, Montreal.
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Continuous Recording of Heart Rate During Operations.—The behaviour of the heart during operations has always been of vital interest to surgeons as an index to the general condition of the patient. Ernst P. Boas and Ernst F. Goldschmidt assert that by means of the cardiometer the heart rate can be continuously recorded irrespective of the posture or degree of activity of the subject. The action current of the heart is led off from the chest by a pair of small electrodes. Ordinary green soap is used to improve the contact between the skin and the electrodes. Wires, which may be several hundred feet long, lead from the electrodes to a specially constructed radio amplifier which amplifies the action current about 6,000 times. The amplified current operates a relay system which in turn actuates an electromagnetic counter on which each heart is automatically recorded. A graphic registering device which marks each heart beat on a moving tape of paper may be attached as well. The ticking of the counter with each beat of the heart is clearly audible, so that the surgeon can hear the changes in rate while he operates. The use of this instrument offers several decided advantages. Palpation of the pulse is a subjective method liable to error, which makes available only occasional sample readings of the heart rate and gives an imperfect picture of its constant fluctuations. They observed frequent discrepancies between the true heart rate recorded by the cardiometer and the rate reported by the anaesthetist. As a rule the rates determined by palpation were too slow. They have employed the cardiometer to record the heart rate during anaesthesia and operation, and present their preliminary results. They report briefly on a study of nineteen cases. Thirteen operations were performed under general anaesthesia, three under local and three under spinal. The operations comprised two cholecystectomies, three prostatectomies, two bladder operations, two suboccipital decompressions, one herniotomy, two operations for undescended testicle, one appendectomy, three operations on the lung, one operation for perinephritic abscess, one for carcinoma of the oesophagus, and one subtotal thyroidectomy. The patients who were operated on had normal hearts, as far as could be ascertained by clinical examination. They found that there was a sudden drop in rate with the first inhalation of ether, and a relatively steady rate once

anaesthesia was well established, in spite of rather radical operative manoeuvres. This is typical of many of the cases studied. The rise in heart rate during the excitement stage of the anaesthetic is characteristic, and in not a few cases it by far exceeds the maximum rate during operation. The dramatic drop in rate induced by the first inhalation of ether is well known, and is undoubtedly a reflex vagus effect due to the irritation of the respiratory mucous membranes. During the operation, once the patient is well anaesthetized, the heart rate is remarkably stable and is little influenced by manipulation of tissues and viscera. In many instances the surgeon deliberately pulled on a viscus such as the gallbladder without inducing any characteristic alteration in the heart rate. They found that, with the patient under the influence of ether, handling of the oesophagus, the development of a pneumothorax or pulling of the testicle, a hernial sac or the gallbladder caused no definite change in the heart rate. Fluctuations in rate were closely linked with the intensity of anaesthesia; when the anaesthesia became light, the heart was accelerated. In two patients who were very sick and toxic, one with peritonitis secondary to appendicitis, and one with lung abscess, the initial rapid heart rate steadily mounted during the course of operation. In the patients who received spinal anaesthesia there was a marked tachycardia as they were brought into the operating room and when the lumbar puncture was performed. With the removal of spinal fluid and the injection of the anaesthetic there was a marked drop in heart rate, which became still more evident when the patient reclined on the operating table. In one case the rate dropped from 133 to 86, and in another from 148 to 91 within twelve minutes. During the operative procedures the rate was rather stable except that vomiting or restlessness on the part of the patient caused a temporary acceleration of the heart rate. Removal of the prostate gland under gas-oxygen, and in one case under spinal anaesthesia resulted in rather high and fluctuating heart rates. Two operations for subtemporal decompression were included in the series, and in these the greatest fluctuations in heart rate were observed. There was first a progressive increase in heart rate with the progress of the operation, although the condition of the patients remained good.

—*J. Am. M. Ass.* 94: April 19, 1930.

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